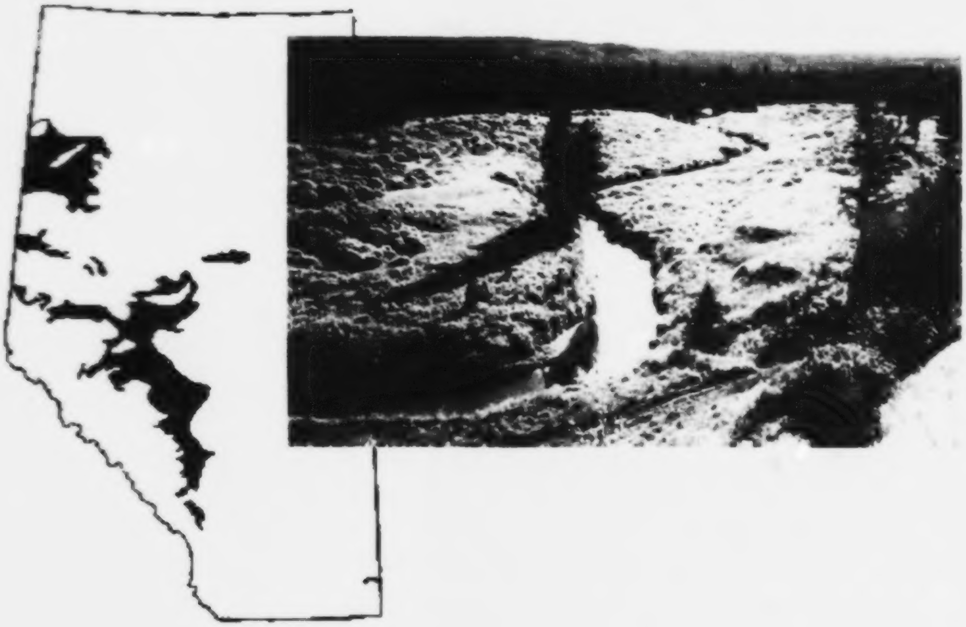
RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE LOWER FOOTHILLS SUBREGION OF ALBERTA



Alberta
SUSTAINABLE RESOURCE
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Public Lands
& Forests

RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY FOR THE LOWER FOOTHILLS SUBREGION OF ALBERTA

Fourth Approximation

2005

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Edmonton
2005

Alberta Sustainable Resource Development
Public Lands and Forests

Pub. No. T/083
ISBN. No. (Printed edition) 0-7785-4097-9
ISBN. No. (On-line edition) 0-7785-4098-7

For copies of this report visit our website at:

http://www3.gov.ab.ca/srd/land/m_rm_classification.html

FOREWORD

In January, 1999 the Rangeland Health Assessment Project was initiated. Its purpose was to coordinate the development of rangeland health assessment methods and ecological site descriptions for both forested and grassland dominated rangelands in the province and transfer the new technology (awareness, information and tools) to livestock producers, staff and other stake holders.

This document "Range plant communities and carrying capacity for the Lower Foothills subregion of Alberta, 4th Approximation" is an effort to organize existing range plant community information for the Lower Foothills subregions into an ecological framework, with the ultimate goal of developing ecological site descriptions as outlined in the Alberta Rangeland Health Task Group, Terms of Reference (1999). This guide encompasses the work of Cam Lane who worked on previous approximations. It also tries to incorporate the work done by Beckingham et al. (1996) on the forested ecosites of West Central Alberta. As we collect new research information, the 4th approximation will evolve into a range ecological site field guide. The 4th approximation has added a range of ecologically sustainable stocking rates that cover the productivity variation within a plant community and takes into account the ecological status of a plant community compared to it's reference plant community. One major outcome of the project will be to produce ecological base information which will be used to develop management tools for northern livestock producers, resource managers and other stakeholders of Alberta's forest. This new knowledge will aide in the sustainable grazing of forested plant communities, and maintain the good health and proper functioning of these ecosystems.

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ABSTRACT

The Green Area lands of the Lower Foothills Subregion are classic examples of multiple use land. They provide summer range for livestock, primary habitat for wildlife, productive watersheds, timber and recreational areas. Despite the importance of many of these communities for livestock grazing, there is very little information on forage production, carrying capacity and how they are influenced by grazing. This lack of information makes it very difficult to develop management prescriptions that address multiple use objectives. As a result guides like this "Ecosites of West-Central Alberta (Beckingham et al. 1996)" are being developed for each Natural and Subregion in the province to provide a framework that will easily group the vegetative community types. It is hoped that these guides will be used by field staff to assess the ecology of the sites and develop management prescriptions.

This guide represents the analysis of 1205 plots described in the Lower Foothills Subregion. The 1205 plots represent 123 community types. These are split into:

a:	Tame Grasslands	9 community types
b:	Native Grasslands	8 community types
c:	Native Shrublands	10 community types
d:	Grazed modified Native Grasslands and Shrublands	5 community types
e:	Aspen forest types	16 community types
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j:	Conifer forest types	21 community types
k:	Grazed modified Conifer forest types	2 community types
l	Harvesting/Burn modified forest types	17 community types
m:	Grazed modified Harvesting/Burn forest types	5 community types

The dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and ecologically sustainable stocking rate are outlined for each type. Total forage production sampling (shrubs, forbs, and graminoids) equals 585 sample plots.

INTRODUCTION

The province of Alberta is covered by a broad spectrum of vegetation regions from prairie in the South, to alpine vegetation in the mountains and dense forests in the Central and Northern parts of the province. These broad vegetation regions have been classified into 6 regions and 20 subregions (Alberta Environmental Protection 1994). Within each subregion, there are groups of plant communities which exist under similar, localized, environmental conditions and can be further influenced by human impacts. Sustainable management of these subregions requires an understanding of the ecology of the site as well as the ability to recognize the vegetative communities that have similar productivity and response to disturbance.

Vegetative communities in the province of Alberta are highly regarded by most resource managers for their ability to provide a wide variety of benefits. They are a classic example of multiple use land, providing summer range for livestock, prime habitat for many species of wildlife, productive watersheds and recreational areas. Despite the importance of these vegetation types there is little information on their ecology. The lack of information makes it very difficult to the development sustainable management prescriptions for multiple use.

The purpose of this guide was to develop a framework that would easily group the plant community types utilized by livestock in the Lower Foothills subregion of the province and provide ecologically sustainable stocking rate information. Plant communities are grouped into a hierarchal system based on ecology. These groupings include successional communities which occur under natural succession or disturbance such as fire, timber or grazing operations. All of the known relationships among communities are described within this guide in table format and/or schematically. Additionally, each known plant community is described in detail.

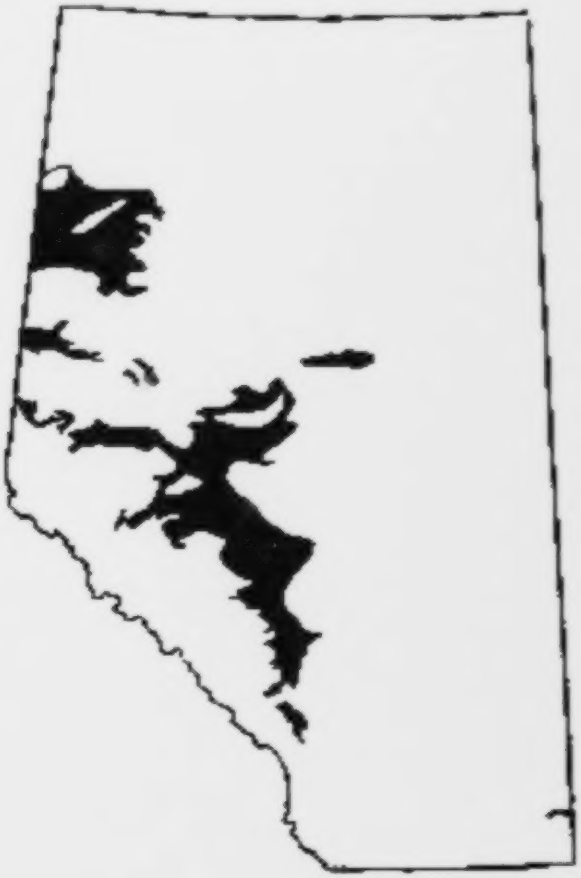
It is hoped this classification system can be used by field staff to assess the ecology and sustainable stocking rate of sites in order to develop management prescriptions on lands within each subregion. This guide supplements the work done by Beckingham et al. (1996) on the forested ecosites of West Central Alberta. Their guide is a good description of the forested community types found within the subregions, but it does not include forage production values or grazing management information. It also does not provide a description of the native grassland and shrubland communities which are utilized extensively by livestock in these subregions

Climatic and Ecological Conditions of the Lower Foothills subregion

Elevationally this subregion is found below the Upper Foothills and above the Boreal Mixedwood subregions. This subregion has a continental climate with a wide amplitude between summer and winter temperatures. The average annual precipitation is 464mm, two thirds of which falls during the summer months. Summer temperatures average 12.8°C and winter temperatures average -7.8°C.

The Lower Foothills subregion is the most arboreally diverse area in Alberta (Strong and

Leggat 1992). The mixture of species which can occur is highly dependent upon geographical location and site history. Stands can be dominated by aspen, balsam poplar, lodgepole pine, white spruce, or black spruce. Deciduous-dominated stands are normally found at lower elevations. Secondary succession of these stands is to white spruce. Lodgepole pine-dominated stands develop on rapidly to well drained sites and southerly aspects. Imperfectly drained sites are dominated by lodgepole pine which, with succession, are invaded by white spruce. Black spruce dominates poorly drained depressions throughout the region.



Map 1: Location of the Lower Foothills Subregion in Alberta

APPROACH AND METHODS OF CLASSIFICATION

Approach: Ecological classification hierarchy and terminology

The system of classification in this guide was initially based on the community type approach of Mueggler (1988). Mueggler's system was chosen over the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because it could classify plant communities irregardless of their successional status. However, as the philosophy of rangeland health and proper functioning condition of a site evolved, it became apparent (through data analysis) that there was a need to also organize the various plant communities based on their response to disturbance (i.e. disturbance vs. natural succession) within an area under similar environmental influences.

It was determined that the ecosystem classification system developed by Corns and Annas (1986) and Beckingham et al. (1996) could accommodate this additional requirement. Thus, the new system developed for rangelands is a combination of Mueggler (1988) and Beckingham et al. (1996). Consequently, this guide adopts a similar ecological unit classification hierarchy (**ecosite, ecosite phase, plant community**). In an effort to first, link the hierarchical system with the historic rangeland system, and second, to create a provincially standardized rangeland approach, slightly different classification terminology was developed. The new terms **ecological site** and **ecological site phase** (replacing Beckingham et al.'s [1996] ecosite and ecosite phase terms respectively), provide subtle distinction to recognize the blending of the old systems and still be recognizable to readers familiar with the original terminology.

Methods: Plant community classification

Sampling for this guide occurred within the Lower Foothills subregion. This guide outlines the classification of 1205 plots. The procedure for inventory of plots followed the Range Survey Manual (1992) and uses the MF5 form. A plot consisted of a 10 m x 10 m macroplot and ten randomly selected 1 m x 1 m microplots to record the canopy cover of shrubs and ten nested 20 cm x 50 cm microplots to record the canopy cover of forbs and grass. The data for each site was analyzed using the multivariate techniques of classification and ordination. Classification is the assignment of samples to classes or groups based on the similarity of species. A polythetic agglomerative approach was used to group the samples. This technique assigns each sample to a cluster which has a single measure. It then agglomerates these clusters into a hierarchy of larger and larger clusters until finally a single cluster contains all the samples (Gauch 1982). Cluster analysis was performed in SAS and Euclidean distance was used as the Cluster Distance Measure and Ward's method was used in the Group Linkage Method. The groupings generated in cluster analysis were overlain on the site ordination to determine final groupings.

Ordination was used to find relationships among species, communities and environmental variables. Ordination reduces the dimensionality of the data to 1-3 most important axes to which environmental gradients can be assigned. The ordination technique used in the analysis of the data was DECORANA (Detrended Correspondence Analysis). DECORANA detrends and rescales the axes thereby reducing the arching and compression of axes problems associated with other ordination techniques (Reciprocal averaging, Principle Components Analysis). Once final groupings were determined on the ordination specific environmental variables can be assigned to the variation outlined on the ordination axes.

Plant community type summaries were generated in SAS, by averaging plant species composition, range in composition, and percent constancy of occurrence, among vegetation inventory plots which were part of a community type. Environmental data was subsequently sorted into the same plant community groupings to create the plant community descriptions outlined in this guide. The number of sample plots on which the description was based is also provided (e.g. n=16).

RANGE MANAGEMENT CONCEPTS AND METHODS

Ecologically sustainable stocking rates

Ecologically sustainable stocking rates (ESSR) values are suggested for each plant community. These values reflect the maximum number of livestock (i.e. **animal unit month** [AUM] per area [e.g. ac]) that can be supported by the plant community given inherent biophysical constraints and the ecological goal of sustainable health and proper functioning of the plant community. When the ESSR is multiplied by the area of a plant community polygon the result is termed **ecologically sustainable carrying capacity (ESCC)**, and is expressed as AUMS. Often the ESCC must be adjusted for management factors (e.g. reduced livestock distribution), management goals (e.g. multiple use and values, etc.), drought conditions, and other natural phenomena impacting the site (e.g. forage quality, fire, pests, etc.). This adjusted/reduced value is the **ecologically sustainable grazing capacity (ESGC)**. The ESGC values are not provided in the plant community guide because the necessary adjustments are determined by the rangeland resource manager.

Suggested ESSR values were determined from a combination of clipping studies, long-term rangeland reference area data, estimated production, and historical grazing experience. In order to sustain ecological health and function of the plant community, the ESSR was based on the allocation of up to 25% of total production for forested plant community types, and up to 50% of total production for grass and shrub land types within the Lower Foothills subregion, and the forage requirements one animal unit (i.e. 455 kg or 1000 lb of dry matter per month). The stocking rate ranges provided, are based on total forage production tempered by the forage value of the contributing plant species and the ecological status of the plant community. For example a plant community with high total production but that is mostly composed of unpalatable or unreachable material will have a high end range value based on less than 25% of total production. If this same plant community is of low ecological status, a further reduction is made to the range and the recommended stocking rate to allow for health recovery. The unallocated biomass production (carry over), is needed for the maintenance of ecological functions (e.g. nutrient cycling, viable diverse plant communities, hydrological function, and soil protection, etc.) and plant community services (forage production, habitat maintenance, etc.). The allocation of biomass production in this manner is well established, and supported, by the scientific community and the percent allocation varies with Natural Subregion (Holechek et al.

1995).

Rangeland Health

Range Health is determined by comparing the functioning of ecological processes on an area (e.g. plant community polygon) of rangeland to a standard (i.e. RPC) described within an ecological site description. An ecological site is similar to the concept of **range site**, but a broader list of characteristics are described. An ecological site is defined by the Task Group on Unity and Concepts (1995) as, "*a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind of amount of vegetation*". This guide can be used to determine the appropriate **reference range plant community**, within an ecological site, for a rangeland health assessment.

Rangeland health assessments are utilized to make a rapid determination of the ecological health of rangeland. We use range health terminology (healthy, healthy with problems, or unhealthy), to rank the ability of rangeland to perform certain ecological functions. These functions include: net primary production, maintenance of soil/site stability, capture and beneficial release of water, nutrient and energy cycling and plant species functional diversity. For a detailed description on how to assess rangeland health for various plant communities please refer to "*Rangeland Health Assessment for Grassland, Forest and Tame Pasture*" (Adams et al. 2003).

An ecological status score [i.e. the integrity of the plant community composition compared to the reference plant community] has been added to each community type description. These values are based on what is currently known about how a reference plant community (RPC) responds to various kinds and levels of disturbance or successional processes. The values indicate how a particular plant community fits in the state and transition model relative to the RPC. If an experienced observer wishes to estimate the health of a plant community without completing a health form, (e.g. a small riparian area), these values can be used as a guide. Occasionally there are 2 options provided for the ecological status score. This was done for two reasons: 1) to express the range of divergence from the RPC possible for a particular plant community; or 2) to allow for different health forms to be used in communities with variable shrub or tree cover (e.g. on sites with high woody cover and/or an obvious LFH layer use the forest rangeland health form and the corresponding ecological status score; on sites dominated by herbaceous cover and/or an obvious herbaceous litter layer use the native grassland form). [Note: For riparian plant communities the riparian health assessment form should be used].

Range management objectives tend to favour the later stages of plant succession (late seral to potential natural community (PNC) or good to excellent range condition) (Adams et al. 2003). Later seral plant communities tend to be superior in the efficient capture of solar energy, in cycling of organic matter and nutrients, in retaining moisture, in supporting wildlife habitat values and in providing the highest potential productivity for the site. In contrast, early seral stages represent plant communities with diminished ecological processes, which are less stable and more vulnerable to erosion and invasion by weeds and non-native species. They also have diminished resource values for livestock forage production, wildlife habitat and watershed protection (Adams et al. 2003). Healthy rangelands perform important ecological functions and provide a broader suite of goods and services. In most cases these late seral plant communities are used as the RPC, but sometimes management goals influence the choice of RPC (e.g. a cut block to be maintained as untimbered rangeland).

HOW TO USE THE GUIDE

Organization of the guide

This guide is an expansion of the Ecosites of West Central Alberta guide (Beckingham et al. 1996). It contains new information and it is recommended that the reader has access to relevant information from both guides. The community types in this guide are closely related to the ecosites and ecosite phases outlined in Ecosites of West Central Alberta (Beckingham et al. 1996), and are similarly arranged (e.g. Table 1a). Table 1a is a reproduction of Figure 11 in Ecosites of West Central Alberta with community types in this guide further separated into reference range plant communities, successional communities and harvesting and fire communities. The "Successional community types" or "Harvesting and Fire succession" categories outline the successional sequence the community types undergo with heavy grazing pressure, harvesting or fire disturbance.

The majority of ecological site and ecological site phase summary tables as well as the plant community descriptions are recorded in Ecosites of West Central Alberta (Beckingham et al. 1996). Any new ecological sites and ecological site phases reported in the fourth approximation are also included in this guide and are summarized before the community type descriptions. The bulk of this guide is community descriptions which include information on the dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and suggested ESSRs. When available, we have included plant community successional information to help us determine rangeland health and the successional relationships on an ecological site.

Generally, in both guides, ecological units within a subregion are classified by their position on the **edatopic grid** [a specific combination of soil moisture and soil nutrient regime].

The information in this guide is presented and named by:

1. Subregion/Ecological area = Lower Foothills
2. Dominant cover type
    A. Tame Pastures
    B. Native Grasslands
    C. Native Shrublands
    D. Grazing Modified Grasslands & Shrublands
    E. Aspen Communities
    F. Aspen - Balsam Poplar Birch Community Types
    G. Aspen Grazed Modified Community Types
    H. Mixedwood Community Types
    I. Mixedwood Grazed Modified Community Types

J. Coniferous Community Types
K. Coniferous Grazed Modified Community Types
L. Forest Cutblock Community Types
M. Grazed Modified Forest Cutblock Community Types

NOTE: As additional information is collected and new ecological units are identified and described, an attempt is made to fit them into the pre-existing ones. At times the usual conventions of naming and organization have to be compromised to accommodate the new units. Sometimes it was necessary to add an additional letter to an existing name to wedge the new unit into the appropriate place within the pre-existing ones. For example, the extra letter in the new ecological site "**dd**" and the pre-existing ecological site "d".

Identifying plant community types

There are two methods to identify plant community types in this guide. The first method uses a key within the dominant cover categories of native grass and shrubland, tame forage, deciduous, or mixedwood and conifer. The second method involves using soil moisture and nutrient information and indicator species to identify plant community types.

Method 1. Use dichotomous key within dominant cover categories

Step 1. Pick the appropriate category the community type is in within each subregion.

- The area does not have an overstory tree canopy and has not been cleared and broken, the community will fall under the NATIVE GRASSLANDS and SHRUBLANDS category.
- The area has been cleared of trees, broken, and seeded down to tame forage species such as timothy or creeping red fescue, the community will be in the TAME GRASS category.
- The DECIDUOUS category includes all plant communities that are dominated, [i.e.≥70% of the overstory], by deciduous tree species. Deciduous cutblocks are included here.
- Communities which have begun to undergo succession from a deciduous to a conifer overstory may fall into the MIXEDWOOD category. The following is a general rule of thumb. The site is a mixedwood community if the conifer and the deciduous overstories each range between 30-70% of the total overstory cover. For example a deciduous cover of 40% and a conifer cover of 60% is a mixedwood community. If in doubt, try to determine if the understory is responding more to a deciduous or coniferous influence [e.g. loss of production due to conifer shading]. Communities dominated [i.e. ≥ 70% of the overstory] by conifers are classified in the CONIFER category.

Step 2. Turn to the appropriate section and work through the key provided to determine the closest matching community type for the site you are evaluating. At times, the community in question does not seem to match any of the known / reported types.

When this happens, consider the following information in the detailed community type descriptions.

1. In the general description text.
   - a. The number of plots utilized to describe the community [n=number of plots]. The greater the number of plots [i.e. information available], the greater the level of confidence in the clarity and accuracy of the description including the suggested ESSR.
   - b. Information about where the community is found on the landscape, response to disturbance, and natural succession. Use this information together with your field experience to determine the likely hood of a similar situation occurring on the site in question.

2. Under Plant Composition heading.
   - a. The range of a plant species canopy cover. For example, a species with a range of 0-25% may not always be visible on the site, having 0% canopy cover or it may have up to 25% cover.
   - b. The consistency value. This indicates the percentage of the plots that the species was actually present. So if n=16 and consistency was 75% then the species occurred in 12 of the plots and not in 4 of them.
   - c. Note that tree species in the shrub LAYER are listed in the shrub section.

3. Try to use the other method to see if you can determine the plant community.

Step 3. This step is necessary only if you are completing a rangeland health assessment. In order to determine the health status of the site in question, you must decide the appropriate reference range plant community [RPC] to compare it to. Depending on the type of disturbance [grazing, timber operations, etc.] successional pathways may differ. The RPC would usually be the plant community that is at the start of the pathway. Management goals can influence the choice of RPC.

Method 2. Use edatope and indicator species

Step 1. Pick the appropriate subregion

Step 2. Determine the appropriate ecological site based on position on the edatopic grid for the subregion. First decide soil moisture status, then soil nutrient status of the site in question. Use any available soils information to assist [e.g. **AGRASID, or PLC**]. [e.g. mesic/medium is the "e" low-bush cranberry ecological site..

Step 3. Look up the possible ecological site phases within the selected ecological site on Table 1a [e.g. has "e1" low-bush cranberry aspen lodgepole pine, "e2" low-bush cranberry aspen, "e3" low-bush cranberry white spruce lodgepole pine etc.

Step 4. Select the appropriate ecological site phase by first determining the dominant overstory [i.e the highest layer of vegetation which can be either a tree, shrub, or grass species]. [e.g. For a site dominated by aspen, the appropriate ecological site phase is "e2" low-bush cranberry aspen.]

Step 5. Select the appropriate community type. Within the selected ecological site phase, use indicator understory species to choose the closest matching community type. This information is shown in table 1a. It is also detailed in the specific community type descriptions [i.e. species with the highest average canopy cover and consistency]. At times, the community in question does not seem to match any of the known / reported types. When this happens, consider the following information in the detailed community type descriptions.

1. In general description text.
    - a. The number of plots utilized to describe the community [n=number of plots]. The greater the number of plots [i.e. information available], the greater the level of confidence in the clarity and accuracy of the description including the suggested ESSR.
    - b. Information about where the community is found on the landscape, response to disturbance, and natural succession. Use this information together with your field experience to determine the likely hood of a similar situation occurring on the site in question.
2. Under Plant Composition heading.
    - a. The range of a plant species canopy cover. For example, a species with a range of 0-25% may not always be visible on the site, having 0% canopy cover or it may have up to 25% cover.
    - b. The consistency value. This indicates the percentage of the plots that the species was actually present. So if n=16 and consistency was 75% then the species occurred in 12 of the plots and not in 4 of them.
    - c. Note that tree species in the shrub LAYER are listed in the shrub section.
3. Try to use the other method to see if you can determine the plant community.

Step 6. This step is the same as step 4 in method 1 and is necessary only if you are completing a rangeland health assessment. In order to determine the health status of the site in question, you must decide the appropriate reference range plant community [RPC] to compare it to. Depending on the type of disturbance [grazing, timber operations, etc.] successional pathways may differ. The RPC would usually be the plant community that is at the start of the pathway. Management goals can influence the choice of RPC.

Table 1a. Ecological sites, ecosite phases, and plant community types of the Lower Foothills subregion (Beckingham et al. 1996, Archibald et al. 1996); range plant community types as well as the influences of grazing and harvesting succession, in bold italics, are found within this guide.

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
a grassland (xeric/poor)	a1 shrubby grassland	a.1 bearberry grassland	*b1* ***bearberry-juniper/sedge***		
			b2 ***bearberry/parry's oatgrass***		
b bearberry/ lichen subxeric/poor	b1 bearberry Aw-Sw-P1	b1.1 Pl/bearberry/ lichen	*h1* ***Pb-Sw/chokecherry-bearberry***		
		b1.2 Pl/blueberry/ lichen			
c hairy wild rye (submesic/ medium)	cl hairy wild rye P1	c1.1 Pl/buffalo-berry/hairy wild rye	*j1* ***Pl/beary/hairy wild rye***		*l1* ***white grained mountain grass/bearberry/Pl-Aw***
		c1.1.2	*j2* ***Pl/bog cranberry/hairy wild rye***		
		c1.2 Pl/green alder/hairy wild rye			
	c2. hairy wild rye Aw	C2.1 Aw/buffalo-berry/hairy wild rye		*g1* ***Aw/rose/hairy wildrye/clover***	
		c2.2 Aw/green alder/hairy wild rye			

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		c2.3 Aw/blueberry/ hairy wild rye	***e1 Aw/blueberry***		
		c2.4Aw/bearberry/ hairy wild rye	***e2 Aw/bearberry/fringed brome***		
	c3 hairy wild rye Aw-Sw-pl	c3.1 Aw-Sw-Pl/ buffalo-berry/hairy wild rye	***h2 Aw-Sw/buffalo-berry-bearberry***		
		c3.2 Aw-Sw-Pl/ alder/hairy wild rye			
		c3.3 Aw-Sw-Pl/ labrador tea/hairy wild rye			*l2* ***Aw/hairy wildrye/dwarf bilberry-labrador tea***
		c3.4 Aw-Sw-Pl/ bearberry/hairy wild rye			
	c4.hairy wild rye Sw	c4.1 Sw/buffalo-berry/hairy wild rye	***j3 Sw/buffalo-berry-bearberry***		*l3* ***buffalo-berry-bearberry/Sw***
	c5 shrubland	c5.	***c1 rose-blueberry/schreber's moss***		
	c6 grassland	c6	***b3 california oatgrass/bearberry***		

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
d labrador tea - mesic (mesic/poor)	d1 labrador tea - mesic - Pl/Sb	d1.1 P1-Sb/labrador tea/feathermoss	***j4 Pl-Sb/labrador tea/feathermoss***		
		d1.2 P1-Sb/alder/ feathermoss			
		d1.3 Pl-Sb/feathermoss	***j5 Pl-Sb/feathermoss***		
	d2 labrador tea - mesic P1	d2.1 Pl/labrador tea/feathermoss	***j6 Pl/labrador tea-bog cranberry***		
		d2.1.1	***j7 Pl/labrador tea-bearberry***		
		d2.2 Pl/bogcranberry			
		d2.3 Pl/feathermoss			
	d3 labrador tea - mesic Aw-Sw-P1	d3.1 Aw-Sw-Pl/labrador tea/feathermoss	***h3 Pl-Sw-Aw/labrador tea/feathermoss***		
e low-bush cranberry (mesic/ medium)	e1 low-bush cranberry P1	e1.1 Pl/green alder	***j8 Pl/alder***		***m1 Aw-Pl/alder/clover/ kentucky bluegrass***
		e1.2 Pl/low-bush cranberry	***j9 Pl/fireweed***	***k1 Pl/kentucky bluegrass/clover***	***l4 Pl/hairy wild rye/rose***
		e1.3 Pl/feathermoss			

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
	e2 low-bush cranberry Aw	e2.1 Aw/buffalo-berry	***e3 Aw/buffalo-berry***		*m2* ***Aw/buffalo-berry/ clover***
		e2.2 Aw/saskatoon	***e4 Aw/saskatoon***		
		e2.3 Aw/alder	***e5 Aw/alder***		
		e2.3.1	***e6 Aw/alder/marsh reedgrass-hairy wild rye***		
		e2.4 Aw/low-bush cranberry			
		e2.5 Aw/rose	***e7 Aw/rose-low-bush cranberry/tall forbs***	***g2 Aw/rose/ strawberry***	***15 Aw/ marsh reedgrass / rose/ fireweed*** 16 ***raspberry / marsh reedgrass / Aw***
				g3 Aw/rose/clover	***m3 strawberry-clover/ rose/marsh reedgrass***
				g4 Aw/kentucky bluegrass/clover	***m4 kentucky bluegrass/ clover-dandelion***
		e2.5.1	***e8 Aw/rose-twinflower***		
		e2.6	***e9 Aw/snowberry***		

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		e2.7	***e10 Aw/white meadowsweet***		
		e2.8	***e11 Aw/hazelnut/wild sarsaparilla***		***l7 hazelnut/Aw/wild sarsapsarilla***
	e3 low-bush cranberry Aw-Sw-Pl	e3.1 Aw-Sw-Pl/buffalo-berry	***h4 Aw-Sw/buffalo-berry***		***m5 clover/timothy/ buffalo-berry/Pl-Sw***
		e3.1.1	***h5 Aw-Pl/buffalo-berry***		
		e3.2 Aw-Sw-Pl/alder	***h6 Aw-Pl/alder***		
		e3.2.1	***h7 Aw-Pb-Sw/alder***		
		e3.3 Aw-Sw-Pl/low-bush cranberry	***h8 Pl-Aw/forb/marsh reedgrass***		
		e3.4 Aw-Sw-Pl/rose	***h9 Aw-Sw/rose/forb***	***i1 Aw-Sw/clover***	
		e3.4.1	***h10 Pl-Sw-Aw/rose/hairy wild rye***		
		e3.4.2	***h11 Aw-Pl-Sw/snowberry***		
		e3.5 Aw-Sw-Pl/feathermoss	***j10 Pl-Sw/twinflower/moss***		
		e3.6			***l8 Aw/willow/purple oatgrass dwarf bilberry***
	e4 low-bush cranberry Sw	e4.1 Sw/green alder			

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		e4.1.1	***jll Sw/buffalo-berry***		
		e4.2 Sw/low-bush cranberry			
		e4.3 Sw/prickly rose		***k2 Sw/clover***	
		e4.4 Sw/fir/feathermoss			
		e4.5 Sw/feathermoss	***j12 Sw/moss***		***19 moss/marsh reedgrass***
	e5 lowbush cranberry shrubland	e5.1	***c2 snowberry-saskatoon***		
		e5.2	***c3 hazelnut/wild sarsaparilla***		
		e5.3		***d3 alder/creeping red fescue/clover***	
f Bracted honeysuckle Subhygric/rich	f1 bracted honeysuckle/ fern Pl	f1.1 pl/bracted honeysuckle/ fern			
		f1.2 Pl/green alder/fern			
		f1.3 Pl/fir/fern			
		f1.4 Pl/devil's-club/fern			
		f1.5 Pl/fern/feathermoss			

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
	f2 bracted honeysuckle/ fern Aw-Pb	f2.1 Aw-Pb/bracted honeysuckle/fern	***f1 Aw-Bw-Pb/bracted honeysuckle/oakfern***		
		f2.1.1	***e12 Aw/bracted honeysuckle***		***l10 Aw/bracted honeysuckle/horsetail***
		f2.1.2	***f2 Pb-Aw/beaked hazelnut***		
		f2.1.3	***f3 Aw-Pb/marsh reedgrass***		
		f2.1.4	***f4 Aw-Pb-Bw/rose/marsh reedgrass***		***l11 marsh reedgrass/Pb/ wild raspberry/fireweed***
		f2.1.5	***f5 Pb/snowberry***		
		f2.2 Aw-Pb/green alder-river alder/fern	***f6 Aw-Pb/green alder/marsh reedgrass***		***l12 Pb/green alder/marsh reedgrass***
		f2.2.1	***f7 Aw-Pb/alder-honeysuckle***		
		f2.2.2	***f8 Aw-Bw/alder-honeysuckle***		
		f2.2.3	***f9 Aw-Pb/river alder***		
		f2.3 Aw-Pb/dogwood/fern	***f10 Aw-Pb/dogwood***		
		f2.3.1	***f11 Aw-Pb/cowparsnip***		

Ecological site	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		f2.3.2	***e13 Aw/thimbleberry***		
		f2.3.3	***e14 Aw/oak fern***		
		f2.3.4	***e15 Aw/willow***		
		f2.3.5			***l13 marsh reedgrass/Bw-Aw/willow***
		f2.4 Aw-Pb/devil's-club/fern	***f13 Pb-Aw/devil's-club***		
	f3 bracted honeysuckle/ fern Aw-Sw-Pl	f3.1 Aw-Sw-Pl/bracted honeysuckle/fern	***h12 Aw-Sw-Pb/bracted honeysuckle***		
		f3.2 Aw-Sw-Pl/green alder/fern			***l14 fireweed/green alder/Pl-Sw***
		f3.3 Aw-Sw-Pl/ dogwood/fern			
		f3.4 Aw-Sw-Pl/fir/fern			
		f3.5 Aw-Sw-Pl/devil's-club/fern	***j13 Se-Pl/cow parsnip***		
		f3.6 Aw-Sw-Pl/fern/ feathermoss			

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
	f4 bracted honeysuckle/ fern Sw	f4.1 Sw/bracted honeysuckle/fern	***j14 Sw/willow-honeysuckle***		***l15 Sw/willow/marsh reedgrass***
		f4.2 Sw/green alder-river alder/fern	***j15 Sw/alder***		
		f4.3 Sw/fir/fern			
		f4.4 Sw/deveil's-club/ern			
		f4.5 Sw/fern/feathermoss			
	f5 shrublands	f5.1	***c4 willow-bog birch/graceful sedge***	***d4 hazelnut/ cowparsnip/kentucky blugrass***	
g meadow (subhygric/very rich)	g1shrubby meadow	g1.1 willow meadow	***c5 willow/slender wheatgrass-fringed brome***	***d5 willow/ kentucky bluegrass/clover***	
		g1.2	***c6 willow/marsh reedgrass***		
	g2 forb meadow	g2.1 cow parsnip meadow	***b4 cow parsnip/veiny meadow rue***	***d1 kentucky bluegrass-timothy/veiny meadow rue***	
	g3 graminoid meadow	***g3.1***	***b5 tufted hairgras-slender wheatgrass/veiny meadow rue***		

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		g3.2	***b6 sedge/veiny meadow rue***	***d2 sedge-kentucky bluegrass/veiny meadow rue***	
h labrador tea - subhygric (subhygric/ poor)	h1 labrador tea - subhygric - Sb-Pl	h1.1 Sb-Pl/labrador tea/feathermoss			
		h1.2 Sb-Pl/alder/feathermoss			
		h1.3 Sb-Pl/feathermoss	***j16 Sb-Pl/moss***		***l16 Pl-Sb/labrador tea/horsetail/moss***
i horsetail (hygric/rich)	i1 horsetail Pb-Aw	i1.1 Pb-Aw/horsetail	***e16 Aw/rose/horsetail***		
		i1.1.1	***f13 Pb/willow/horsetail***		
	i2 horsetail Pb-Sw	12.1 Pb-Sw/horsetail			
	i3 horsetail Sw	i3 Sw/horsetail (/stair-step moss)	***j17 Sw/horsetail/moss***		
		13.2 Sw/feathermoss (Sw/stair-step moss)			
	i4 horsetail shrubland	***i4.1***	***c7 alder/marsh reed grass***		
		i4.2	***c8 willow/horsetail***		

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		i4.3	***c9 willow-alder/fern***		
j labrador tea/horsetail hygric/medium	j1 labrador tea/horsetail Sb-Sw	j1.1 Sb-Sw/labrador tea/horsetail	***j18 sb/labrador tea/horsetail/moss***		
		j1.2 Sw-Sb/feathermoss			***l17 willow/hair-like sedge/Sw***
		j1.3 Sb/horsetail/ feathermoss			
k dog subhydric/poor	k1 treed bog	k1.1 Sb/labrador tea/ cloudberry/peat moss	***j19 Sb/labrador tea-bogcranberry/ cloudberry***		
	k2 shrubby bog	k2.1 labrador tea/cloudberry/peat moss			
l poor fen subhydric/medium	l1 treed poor fen	l1.1 Sb-Lt/dwarf birch/sedge/peat moss	***j20 Sb-Lt/sedge/moss***		
	l2 shrubby poor fen	l2.1 dwarf birch-willow/sedge/peat moss	***c11 dwarf birch-willow/sedge/peatmoss***		
m rich fen subhydric/rich	m1 treed rich fen	m1.1 Lt/dwarf birch/sedge/golden moss	***j21 Lt/bog birch/sedge/moss***		
	m2 shrubby rich fen	m2.1 dwarf birch/sedge/golden moss	***c10 willow-bog birch/water sedge***		

Ecological site	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		m2.2 willow/sedge/golden moss			
	m3 graminoild rich fen	m3.1 sedge rich fen	***b7 marsh reed grass slough***		
		m3.2 sedge/brown moss	***b8 water edge meadow***		
n marsh hydric/rich	n1 marsh	n1.1 cattail marsh			
		n1.2 bulrush marsh			

Table 1b: Tame grassland range plant community types linked with the associated ecological site and ecosite phase adapted from Beckingham et al. 1996.

Ecological site	**Ecosite phase**	**Plant community type**	**Range plant community type**
c hairy wild rye submesic/medium	c2 hairy wild rye aspen	*c2.*	a4 creeping red fescue/slender wheatgrass/clover
			a7 hairy wild rye/clover
e low-bush cranberry (mesic/medium)	e2 low-bush cranberry aspen	*e2.4*	a8 kentucky bluegrass/clover-dandelion
			a16 creeping red fescue-timothy/clover
			a17 creeping red fescue-Kentucky bluegrass/clover
			a18 Kentucky bluegrass/tall butter cup
			a19 creeping red fescue-marsh reed grass/upland sedge/rose

f braced honeysuckle (subhygric/rich)	f2 bracted honeysuckle/fern Aw-Pb	***f2.1***	a15 sedge-timothy/horsetail
			a20 reed canary grass-creeping red fescue/clover

Table 2. Ecological site forage production summary of the Lower Foothills subregion

Ecological site	Total Production (kg/ha)	Suggested Stocking Rate (ha/AUM)	Sample size (n)
a grassland (subxeric/poor)	297	0.0	5
b bearberry/lichen (submesic/poor)	712	2.6	1
c hairy wild rye (submesic/medium)	749	2.4	37
d labrador tea - mesic (mesic/poor)	721	2.5	21
e low bush-cranberry (mesic/medium)	1030	1.8	322
f bracted honeysuckle (subhygric/rich)	1315	1.4	149
g meadow (subhygric/very rich)	2264	0.4	23
h labrador tea - subhygric (subhygric/poor)	n/a	0.0	0
i horsetail (hygric/rich)	1070	1.7	9
j labrador tea/horsetail (hygric/medium)	n/a	0.0	0
k bog (subhydric/poor)	1144	0.0	2
l poor fen (subhydric/medium)	757	0.0	8
m rich fen (subhydric/rich)	2766	0.0	7
n marsh (hydric/rich)	n/a	0.0	0

Table 3. Ecosite phase forage production summary for the Lower Foothills subregion

Ecological site	Ecosite phase	Total production (kg/ha)	sample size (n)	Suggested Grazing capacity (ha/AUM)
a bearberry grassland xeric/poor	a1 shrubby grassland	297	5	non-use
b bearberry lichen subxeric/poor	b1 bearberry Aw-Sw-Pl	712	1	2.6
c hairy wild rye submesic/medium	c1 hairy wild rye Pl	495	12	3.7
	c1_harvest Pl	886	2	3.7
	c2 hairy wild rye Aw	960	7	1.9
	c2_grazed Aw	374	2	4.8
	c3 hairy wild rye Aw-Sw-Pl	558	2	3.3
	c3_harvest Aw-Sw-Pl	2129	2	3.3
	c4 hairy wild rye Sw	468	5	3.9
	c4_harvest Sw	1419	2	3.9
	c5 shrubland	1252	1	1.5
	c6 grassland	652	1	1.4
d labrador tea - mesic mesic/poor	d1 labrador tea - mesic Pl-Sb	n/a	0	non-use
	d2 labrador tea - mesic Pl	888	7	2.1
	d3 labrador tea - mesic Aw-Sw-Pl	637	14	2.9

e low-bush cranberry mesic/medium	**e1 low bush cranberry Pl**	**610**	**1**	**3.0**
	e1_grazed Pl	**1344**	**1**	**1.4**
	e1_harvest Pl	**1084**	**9**	**3.0**
	e1_harvest_grazed Pl	**2210**	**3**	**3.0**
	e2 low bush cranberry Aw	**917**	**116**	**2.0**
	e2_grazed Aw	**944**	**75**	**2.0**
	e2_harvest Aw	**2084**	**16**	**2.0**
	e2_harvest_grazed Aw	**1418**	**9**	**2.0**
	e3 low bush cranberry Aw-Sw-Pl	**750**	**69**	**2.4**
	e3_grazed Aw-Sw-Pl	**496**	**2**	**3.7**
	e3_harvest Aw-Sw-Pl	**1756**	**1**	**2.4**
	e3_harvest_grazed Aw-Sw-Pl	**4070**	**1**	**2.4**
	e4 low bush cranberry Sw	**489**	**13**	**3.7**
	e4_grazed Sw	**778**	**1**	**2.3**
	e4_harvest Sw	**1755**	**4**	**3.7**
	e5 low bush cranberry shrubland	**1776**	**3**	**1.5**
	e5_grazed shrubland	**3466**	**1**	**0.3**
f bracted honeysuckle subhygric/rich	**f1 bracted honeysuckle Pl**	**900***	**0**	**2.0**

	f2 bracted honeysuckle Aw-Pb	**1244**	**138**	**1.5**
	f2_harvest Aw-Pb	**4008**	**3**	**1.5**
	f3 bracted honeysuckle Aw-Sw-Pl	**2014**	**1**	**0.9**
	f3_harvest Aw-Sw-Pl	**2610**	**2**	**2.0**
	f4 bracted honeysuckle Sw	**592**	**3**	**3.1**
	f4_harvest Sw	**1608**	**1**	**3.1**
	f5 shrubland	**1885**	**6**	**1.0**
	f5_grazed shrubland	**1676**	**1**	**1.1**
g meadow subhygric/very rich	**g1 shrubby meadow**	**2798**	**8**	**0.4**
	g1_grazed shrubby meadow	**2165**	**4**	**0.4**
	g2 forb meadow	**2100**	**1**	**0.4**
	g2_grazed forb meadow	**2846**	**1**	**0.4**
	g3 graminoid meadow	**2803**	**2**	**0.4**
	g3_grazed graminoid meadow	**2615**	**2**	**0.4**
h labrador tea subhgyric subhygric/poor	**h1 labrador tea - subhygric Sb-Pl**	**n/a**	**0**	**non-use**
	h1_harvest Sb-Pl	**n/a**	**0**	**non-use**
i horsetail hygric/rich	**i1 horsetail Pb-Aw**	**1260**	**6**	**1.4**
	i3 horsetail Sw	**n/a**	**0**	**non-use**

	i4 shrubland	**1671**	**4**	**1.2**
j labrador tea/horsetail hygric/medium	**j1 labrador tea/horsetail Sb-Sw**	**n/a**	**0**	**non-use**
	j1_harvest Sb-Sw	**n/a**	**0**	**non-use**
k bog subhydric/poor	**k1 treed bog**	**1144**	**2**	**non-use**
	k2 shrubby bog	**n/a**	**0**	**non-use**
l poor fen subhydric/medium	**l1 treed poor fen**	**757**	**9**	**non-use**
	l2 shrubby poor fen	**n/a**	**0**	**non-use**
m rich fen subhydric/rich	**m1 treed rich fen**	**1755**	**3**	**non-use**
	m2 shrubby rich fen	**3048**	**5**	**non-use**
	m3 graminoid rich fen	**2061**	**2**	**non-use**
n marsh hydric/rich	**n1 marsh**	**n/a**	**0**	**non-use**

TAME PASTURE COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 1: Typical Range improvement clearing seeded to creeping red fescue, timothy and alsike clover in the Lower Foothills subregion

TAME FORAGE COMMUNITIES

(Cleared areas that have been broken and seeded to tame forage)

Throughout the Lower Foothills subregion there are sites that have been deforested, broken, and seeded to tame forage. Usually thses areas are mesic and moderately well to well drained with good nutrient levels. Because most of these tame forage stands are established on similar sites, the most influential factors affecting plant species composition are stand establsihment and grazing regime (photo 2).

Stand establsihment is important because it determines what the inital plant species composition is going to be. Seed bed preparation and the type of seed sown are the two most important factors influencing stand establishment. Seed bed preparation is important because it helps to determine how well the sown seed germinates and establishes. If the seed bed is not well prepared the tame forage stand may establish poorly and native species can become a dominant component of the plant community. If the seed bed is well prepared, the community type that establishes will depend on the type of seed sown.

After the stand is established, the grazing regime applied to the stand will determine the plant species composition. Generally, a light to moderate amount of grazing allows the stand to maintain itself while sustained heavy grazing causes the stand to degrade. Damage to a stand due to over grazing occurs more readily while the stand is establshing than it does when the stand is establshed. This is because the forage plants in an establishing stand have not had time to develop energy reserves in their roots, and are therefore, more susceptible to grazing induced damage.

Well distributed light to moderate grazing will normally maintain a forage stand similar to what was seeded on the site. These stands are generally the most productive and provide the best grazing opportunities for livestock. They are normally considered to be healthy. Non use or very light grazing often results in the stand becoming dominated by the forage species that is most competitive under an ungrazed situation. Plant community changes which occur under heavy grazing are dependent on the grazing history (level of use, season of use and duration of the grazing regime). Overgrazed community types develop over a long period of repeated overgrazing. If weedy species such as tall buttercup, become establsihed on overgrazed sites, they can quickly become a dominant species (Photo 4).

Phote 5 illustrates the effects of seed establishment and grazing regime on a site's productivity.

TAME PASTURE COMMUNITY TYPES

Photo 2: A moderately grazed range improvement clearing. Rose is starting to invade from adjacent aspen forest as a result of the grazing pressure.

Photo 3: A recently cleared range improvement site seeded to timothy, creeping red fescue, and clover.

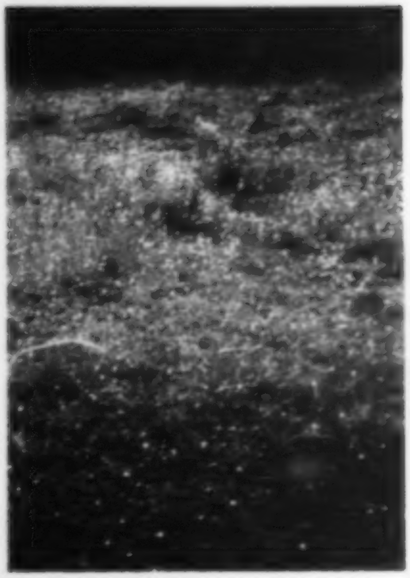


Photo 4: Tall buttercup, a noxious weed, has invaded into a heavily-grazed Kentucky bluegrass/Cover-Dandelion community. Tall buttercup is a poisonous weed which invades onto moist sites that have exposed or disturbed soils.

Photo 5: Poor seed establishment of creeping red fescue combined with heavy grazing pressure has resulted in low productivity and an abundance of exposed soil. These are prime conditions for invasion by weeds.

Figure 1: Successional sequences of tame pasture on three moisture regimes in the Lower Foothills subregion.

SUBMESIC SITES	MESIC SITES	SUBHYGRIC SITES
Slender wheatgrass-Creeping red fescue/ Clover a 4	Marsh Reed Grass / Rose / Strawberry a19	Sedge / Timothy / Horsetail a 15
	succession back to native, invaded by shrubs & trees	
Hairy Wild Rye/ Clover a 7	Timothy-Creeping red fescue/ Clover a 16	Reed Canary Grass-Meadow foxtail/Clover a20
	moderately grazed	
	Creeping Red Fescue - Kentucky Bluegrass-Timothy / Clover a 17	
	heavily grazed	
	Kentucky Bluegrass / Clover - Dandelion a 8	
	very heavily grazed	
	Kentucky Bluegrass / Weeds a18	

Table 4. Forage production and stocking rate of tame forage communities in the Lower Foothills subregion.

Ecological Site	Community Type	Total Prod. (kg/ha)	Stocking Rate ha/AUM (AUM/ac) Range	Recommended
c hairy wildrye submesic/medium	a7 hairy wild rye/clover	1228	1.34-0.67 (0.3-0.6)	0.67 (0.6)
	a4 slender wheatgrass-creeping red fescue/Clover	2852	1.34-0.51 (0.3-0.8)	0.67 (0.6)
e low-bush cranberry mesic/medium	a16 timothy-creeping red fescue/clover	4621	0.41-0.3 (1.0-1.3)	0.4 (1.0)
	a19 marsh reed grass/Rose/strawberry	1868		
	a 17 creeping red fescue-Kentucky Bluegrass-	1816	0.58- 0.4 (0.7-1.0)	0.51 (0.8)
	timothy/clover	3229	0.58- 0.4 (0.7-1.0)	0.51 (0.8)
	a8 Kentucky bluegrass/clover-dandelion	3446	0.81- 0.58 (0.5-0.7)	0.67 (0.6)
	a18 Kentucky bluegrass/weeds	3450	1.34-0.81 (0.3-0.5)	1.0 (0.4)
f bracted honeysuckle subhygric/rich	a20 Reed Canary grass-meadow foxtail/clover	3525	0.41-0.3 (1.0-1.3)	0.34 (1.2)
	a15 Sedge/timothy/horsetail	3000	0.51-0.4 (0.8-1.0)	0.4 (1.0)

Key to Tame Forage Communities - Lower Foothills Subregion

1. Tame forage stand dominated by tall productive species, grazing has not cause an increase of grazing resistant or weedy species..2
Tame forage stand modified by overgrazing with grazing resistant species at least co-dominant in the plant community; or the site has native species invasion............................4

2. Subhygric site dominated by productive, moisture loving tame forage species seeded on the site (ie., reed canary grass, meadow foxtail, timothy)....reed canary grass-creeping red fescue/clover (a20).
Mesic or submesic site dominated by productive tame forage species suited to normal or dry moisture conditions (ie., smooth brome, meadow brome, timothy, wheatgrass etc.)...3

3. Submesic sites with wheatgrass, hairy wildrye and creeping red fescue.............**hairy wild rye/clover (a7).**
Mesic sites dominated by timothy, creeping fescue and clovers....**timothy-creeping red fescue/clover(a16).**

4. Species composition modified by grazing allowing grazing resistance species to dominate...5
Species composition modified by native tree, shrub, forb and/or grass invasion...............7

5. Pasture moderately to heavily grazed, tall productive forages and grazing resistant forages co-dominate the site.....................**creeping red fescue-Kentucky bluegrass-timothy/clover (a17)**.
Pasture heavily to very heavily grazed; grazing resistant species and/or weedy or disturbance induced species dominate the site...6

6. Pasture heavily grazed; grazing resistant species dominate the site; dandelion, strawberry and other weedy or disturbance induced species present......**Kentucky bluegrass/clover-dandelion (a8).**
Pasture very heavily grazed; grazing resistant, disturbance induced, and weedy species dominate the sites; noxious weeds invading.....**Kentucky bluegrass/weeds (a18).**

7. Mesic site with native tree, shrub, grass and forb invasion................**marsh reed grass/rose/strawberry (a19).**
Subhygric site with native sedges and horsetails and other moisture loving native plants re-establishing on the site...**sedge/timothy/horsetail (a15).**
Submesic site with native shrub, forb and grass re-establishment......**slender wheatgrass-creeping red fescue/clover(a4).**

a4: Slender wheatgrass-Creeping red fescue / Clover

(Agropyron trachycaulum-Festuca rubra / Trifolium spp.)

n=3 This community type occurs on cleared pastures that were seeded with a creeping red fescue - timothy / clover seed mix. However, because of poor seedbed preperation and poor establishment of the seed mixture (possibly due also to the drier site conditions), slender wheatgrass has invaded onto the site.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
FORBS			
CLOVER (*Trifolium spp.*)	30	20-43	100
DANDELION (*Taraxacum officinale*)	9	0-18	96
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	18	0-31	67
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	0-20	67
TIMOTHY (*Phleum pratense*)	9	0-4	67
KENTUCKY BLUEGRASS (*Poa pratensis*)	3	0-3	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC

NUTRIENT REGIME:
MESOTROPHIC

SOIL DRAINAGE:
WELL

ELEVATION (MEAN):
823-970(923)M

SLOPE: 0-7%

DESIRABLE SPECIES SHIFT SCORE: 8-4

FORAGE PRODUCTION(KG/HA)N=3

TOTAL 2852

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.67 HA/AUM (1.34-0.51)
0.6 AUM/AC (0.3-0.8)

a7: Hairy wild rye / Clover

(Elymus innovatus/ Trifolium spp.)

n=2 This pasture community type has been modified from the original seeded mixture. After the original seeing (Creeping Red Fescue - Timothy - Clover) the pasture was grazed for 5-7 years and cultivated. Hairy Wild Rye invaded the site following cultivation, likely from the adjacent Aw/blueberry/Hairy wild rye stands.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CLOVER (*Trifolium spp.*)	8	0-15	50
STRAWBERRY (*Fragaria virginiana*)	8	7-8	100
DANDELION (*Taraxacum officinale.*)	1	0-2	50
YARROW (*Achillea millefolium*)	3	1-4	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	24	14-33	100
SEDGE *(Carex spp.)*	9	4-14	100
PURPLE OATGRASS *(Schizachne purpurascens)*	3	2-3	100
KENTUCKY BLUEGRASS (*Poa pratensis*)	2	2-3	100
TIMOTHY (*Phleum pratense*)	2	2-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC

SOIL DRAINAGE:
WELL

ELEVATION: 950 M

SLOPE: 1%

ASPECT: SOUTHERLY

DESIRABLE SPECIES SHIFT SCORE: 8

FORAGE PRODUCTION(KG/HA)

TOTAL 1228

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.67 HA/AUM (1.34-0.67)
0.6 AUM/AC (0.3-0.6)

a8: Kentucky Bluegrass / Clover - Dandelion

(Poa pratensis/ Trifolium repens or hybridum - Taraxacum officinale)

n=49 This community type has had a history of being grazed heavily throughout the growing season. Heavy grazing throughout the gorwing season, allows kentucky bluegrass, clover, and dandelion to outcompete all of the other vegetation. Generally, forage production is usually degraded on these over-grazed pastures with forage production 30-50% lower than healthy pasture.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CLOVER (*Trifolium spp.*)	30	2-68	100
DANDELION (*Taraxacum officinale*)	20	3-56	100
COMMON YARROW (*Achillea millefolium*)	2	0-23	78
STRAWBERRY (*Fragaria virginiana*)	2	0-17	57
GRASSES			
KENTUCKY BLUEGRASS (*Poa pratensis*)	42	0-84	98
TIMOTHY (*Phleum pratense*)	5	0-40	89
CREEPING RED FESCUE (*Festuca rubra*)	3	0-45	45

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN):
788-1572 (1061) M

SLOPE: 0-25%

ASPECT: VARIABLE

DESIRABLE SPECIES SHIFT SCORE: 4-0

FORAGE PRODUCTION(KG/HA)

TOTAL 3446

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.67 HA/AUM (0.81-0.58)
0.6 AUM/AC (0.5-0.7)

a15: Sedge - Timothy / Horsetail

(Carex spp./ Phleum pratense / Equisetum spp.)

n=3 This community type occurs on range improvement areas or reclaimed areas that have a high water table. Because of this high water table, the creeping red fescue-timothy / clover mix that was seeded did not become well established and the site has been reinvaded by native wetland species.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
FIELD HORSETAIL (*Equisetum arvense*)	9	1-24	100
CLOVER (*Trifolium spp.*)	12	0-33	67
DANDELION (*Taraxacum officinale*)	1	1-2	100
WOODLAND HORSETAIL (*Equisetum slyvaticum*)	11	0-32	67
GRASSES			
SEDGE (*Carex spp.*)	28	6-50	100
TIMOTHY (*Phleum pratense*)	5	1-10	100
KENTUCKY BLUEGRASS (*Poa pratensis)*	20	0-55	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO HYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

SOIL DRAINAGE:
IMPERFECTLY TO MODERATELY WELL

ELEVATION (MEAN) :
1067-1189 (1128) M

SLOPE: 0-2%

DESIRABLE SPECIES SHIFT SCORE: 8-4

FORAGE PRODUCTION(KG/HA)

TOTAL	3000

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.40 HA/AUM (0.51-0.4)
1.0 AUM/AC (0.8-1.0)

a16: Timothy-Creeping red fescue/Clover

(Phleum pratense-Festuca rubra/Trifolium spp.)

n=34 This community type occurs on cleared pastures that were seeded with a mixture that likely included a combination of timothy, brome grasses, orchard grass, creeping red fescue and clover species. Light to moderate grazing will likely maintain the original seed mixture, but prolonged heavy grazing will allow grazing resistance species such as creeping red fescue, Kentucky bluegrass and clovers to dominate the site (a17). Very heavily grazed sites may even become invaded with disturbance and weedy species (a18, a19).

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
LINDLEY'S ASTER (*Aster ciliolatus*)	2	0-12	56
CLOVER (*Trifolium spp.*)	23	21-43	100
DANDELION (*Taraxacum officinale*)	8	0-33	85
GRASSES			
CREEPING RED FESCUE (*Festuca rubra*)	24	0-61	88
TIMOTHY (*Phleum pratense*)	35	0-20	97
KENTUCKY BLUEGRASS (*Poa pratensis*)	7	0-27	85
SMOOTH BROME (*Bromus inermis*)	2	0-36	20
ORCHARD GRASS (*Dactylis glomerata*)	2	0-23	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN) :
762-1349(993) M

SLOPE:VARIABLE

DESIRABLE SPECIES SHIFT SCORE: 8

FORAGE PRODUCTION(KG/HA)

TOTAL 4621

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.40 HA/AUM (0.4-0.3)
0.8-1.0 AUM/AC (1.0-1.3)

a17: Creeping red fescue-Kentucky bluegrass-Timothy/Clover

(Festuca rubra-Poa pratensis-Phleum pratense/Trifolium spp.)

n=117 This community type seems to have developed because of either poor establishment of seeded species or prolonged heavy grazing. Although tall productive species such as timothy, brome grass and orchard grass were likely seeded on the site, grazing resistance species such as creeping red fescue and Kentucky bluegrass now dominate. Continue heavy grazing will likely allow disturbance species and/or weedy species to invade (a18, a19). Although forage production on these sites can be high, the ecological stocking rate has been reduced to help improve range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
STRAWBERRY (*Fragaria virginiana*)	2	0-21	79
CLOVER (*Trifolium spp.*)	22	0-56	92
DANDELION (*Taraxacum officinale*)	16	0-44	97
GRASSES			
CREEPING RED FESCUE (*Festuca rubra*)	29	0-86	97
TIMOTHY (*Phleum pratense*)	9	0-35	93
KENTUCKY BLUEGRASS (*Poa pratensis*)	19	0-68	93

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN):
701-1570(1108) M

SLOPE: VARIABLE

DESIRABLE SPECIES SHIFT SCORE: 8-4

FORAGE PRODUCTION(KG/HA)

TOTAL 3229

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.51HA/AUM (0.58-0.4)
0.8 AUM/AC (0.7-1.0)

a18: Kentucky bluegrass/Weeds

(Poa pratensis/Ranunculus repens-Carum carvi)

n=8 This community type has a history of heavy grazing and various weeds have invaded into the stand. Heavy grazing favours the growth of weedy species because there are not as palatable as other forbs or grasses and are therefore not grazed as intensively. Because the weedy species are not utilized they are able to flower and propagate by seed. It is also able to outcompete the species that previously inhabited the site (a Kentucky Bluegrass/ Clover - Dandelion community type). This community type is considered to be in poor condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
CARAWAY (*Carum carvi*)	9	0-98	38
CLOVER (*Trifolium spp.*)	17	4-35	100
DANDELION (*Taraxacum officinale*)	11	1-20	100
TALL BUTTERCUP (*Ranunculus acris*)	12	0-28	62
GRASSES			
CREEPING RED FESCUE (*Festuca rubra*)	7	0-23	38
TIMOTHY (*Phleum pratense*)	11	0-46	96
KENTUCKY BLUEGRASS (*Poa pratensis*)	25	0-74	96
UPLAND SEDGE (*Carex spp.*)	4	0-20	63

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN):
853-1219(1012) M

SLOPE: VARIABLE

DESIRABLE SPECIES SHIFT SCORE: 0

FORAGE PRODUCTION(KG/HA)

TOTAL 3450

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.0HA/AUM (1.34-0.81)
0.4AUM/AC (0.3-0.5)

a19: Marsh reedgrass/Rose/Strawberry

(Calamagrostis canadensis/Rosa acicularis/Fragaria virginiana)

n=8 This community type occurs on clear-cuts that were recently harvested or on range improvement that had poor seed establishment. Native tree, shrub, grasses and forbs have re-established on the site. Under light grazing or no grazing this community type will likely succeed to aspen forest. With heavy grazing Kentucky bluegrass and creeping red fescue will likely dominate the site.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(*Populus tremuloides*)	1	0-8	50
SHRUBS			
ROSE			
(*Rosa spp.*)	6	0-12	88
RASPBERRY			
(*Rubus idaeus*)	2	0-5	75
FORBS			
STRAWBERRY			
(*Fragaria virginiana*)	6	1-17	100
CLOVER			
(*Trifolium spp.*)	9	0-49	94
DANDELION			
(*Taraxacum officinale*)	4	1-10	100
LINDLEY'S ASTER			
(*Aster ciliolatus*)	4	1-9	100
FIREWEED			
(*Epilobium angustifolium*)	5	0-15	88
DEWBERRY			
5025			
GRASSES			
TIMOTHY			
(*Phleum pratense*)	4	0-33	88
KENTUCKY BLUEGRASS			
(*Poa pratensis*)	2	0-8	63
UPLAND SEDGE			
(*Carex spp.*)	3	0-9	75
MARSH REEDGRASS			
(*Calamagrostis canadensis*)	20	7-41	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC-SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN) :
697-1219(952) M

SLOPE: VARIABLE

DESIRABLE SPECIES SHIFT SCORE: 8-4

FORAGE PRODUCTION(KG/HA)

TOTAL 1868

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.51HA/AUM (0.58-0.4)
0.8AUM/AC (0.7-1.0)

a20: Reed canary grass-Meadow foxtail/Clover

(Phalaris arundinacea-Festuca rubra/Trifolium spp.)

n=8 This community type occurs on cleared pastures that were seeded with a mixture that likely included a combination of reed canary grass, meadow foxtail, timothy, creeping red fescue and clover species. Light to moderate grazing will likely maintain the original seed mixture, but prolonged heavy grazing will allow grazing resistance species such creeping red fescue, Kentucky bluegrass and clovers to become dominant. Very heavily grazed sites may even become invaded with disturbance and weedy species.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
WESTERN DOCK (*Rumex occidentalis*)	1	0-3	13
CLOVER (*Trifolium spp.*)	18	1-38	100
DANDELION (*Taraxacum officinale*)	8	1-34	100
WATER PARSNIP (*Sium suave*)	1	0-8	13
MEADOW HORSETAIL (*Equisetum pratense*)	1	0-5	43
GRASSES			
CREEPING RED FESCUE (*Festuca rubra*)	11	0-41	63
TIMOTHY (*Phleum pratense*)	5	0-14	63
KENTUCKY BLUEGRASS (*Poa pratensis*)	5	0-13	63
REED CANARY GRASS (*Phalaris arundinacea*)	12	0-55	38
MEADOW FOXTAIL (*Alopercurus pratensis*)	25	0-60	63

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO WELL

ELEVATION (MEAN) :
762-1189(962) M

SLOPE:<5%

DESIRABLE SPECIES SHIFT SCORE: 8

FORAGE PRODUCTION(KG/HA)

TOTAL 3525

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.34HA/AUM (0.41-0.3)
0.8AUM/AC (1.0-1.3)

NATIVE GRASSLANDS
OF THE
LOWER FOOTHILLS SUBREGION

Photo 6: A typical water sedge meadow surrounded by willow shrublands. These are generally non-use for livestock due to the wet substrate, however, the drier edges where willow dominates can be used once the water table drops later in the season.

NATIVE AND SHRUBLANDS GRASSLANDS

Within the Lower foothills subregion, shrublands and native grasslands are associated with lowland, seepage, riparian areas or south and west facing slopes.

The lowland sites which are routinely flooded can be arranged along a moisture gradient. Sites that are flooded for most of the year are dominated by the Wet Sedge meadows. Areas that are flooded during the spring and have the water table remain near the soil surface for the remainder of the year are invaded by willow and bog birch to form the Willow-Bog Birch/Sedge community type. Drier sites where the water table falls well below the soil surface later in the season are dominated by willow and marsh reedgrass to form the Willow/Marsh Reed Grass or the Marsh Reedgrass community types. These sites are not readily grazed, but if there are no better grazing opportunities in close proximity these sites may be heavily utilized to form Kentucky bluegrass, timothy, clover and dandelion dominated community types.

Areas that are occasionally flooded and located next to rivers and streams are typically vegetated by Cow parsnip/Veiny Meadow rue on rich sites or Sedge/Veiny meadow rue on poorer sites. In the absence of disturbance these sites can be invaded by willow or aspen to form the Willow/Slender Wheat grass- Fringed Brome shrubland or aspen dominated forest. Prolonged heavy grazing of these community types generally reduces the cover of native grass and forb species and allows Kentucky bluegrass, timothy, clover and dandelion to dominate the site.

There are a number of upland shrub dominated community types that were described in the Lower Foothills subregion. These included Alder/Marsh reedgrass and Alder/Fern communities which were found on nutrient rich, seepage areas, with east and northerly aspects. These community types are very productive, but are generally not utilized by livestock because of the thick shrub cover which limits access. On more mesic, south and west facing slopes Hazelnut/Wild sarsaparilla and Snowberry-Saskatoon communities were described. These communities are generally of fire origin and will eventually succeed to aspen dominated forest.

There were a number of grassland community types described on steep, rapidly drained south facing slopes. These included the Parry oatgrass/Bearberry and Bearberry-Juniper/Sedge dominated community types. These community types tend to occupy the steep slopes along the major rivers throughout the region. These communities tend to be too steep and unproductive for livestock use. There was one community type (California oatgrass/Bearberry) which was described in the Saddle Hills. This community appears to be related to the California oatgrass dominated communities described by Wilkinson and Johnson (1982) on solonetzic soils in the Peace River region of the province. The sequence of grass and shrubland communities in the Lower Foothills subregion is outlined in Figures 2, 3 and 4.

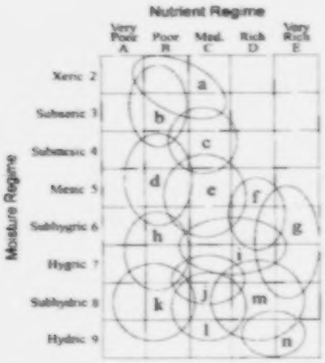
Table 5. Forage production summary for Native Grasslands of the Lower Foothills subregion

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
a bearberry grassland subxeric/poor	**Ecosite phase**	**a1 shrubby grassland**						**40 (0.01)**
	b1	bearberry-juniper/sedge	112	252	144	507	40-3.37 (0.01-0.12)	40 (0.01)
	b2	bearberry/Parry's oatgrass	18	8	60	86	40-0.81 (0.01-0.05)	40 (0.01)
c hairy wild rye submesic/ medium	**Ecosite phase**	**c6 grassland**						**2.7 (0.15)**
	b3	california oatgrass/bearberry	444	144	64	652	4-2 (0.1-0.2)	2.7 (0.15)
g meadow subhygric/ very rich	**Ecosite phase**	**g2 forb meadow**						**0.58 (0.70)**
	b4	cowparsnip/veiny meadow rue	1200	800	100	210	0.81-0.4 (0.50-1.0)	0.58 (0.70)
	Ecosite phase	**g2_grazed forb meadow**						**0.81 (0.5)**

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	d1	kentucky bluegrass-timothy/veiny meadow rue	1190	614	1042	2846	2-0.58 (0.2-0.7)	0.81 (0.5)
	Ecosite phase	**g3 graminoid meadow**						**0.58 (0.70)**
	b5	tufted hairgrass-slender wheatgrass/veiny meadow rue	1355	1670	0	3025	0.81-0.4 (0.5-1.0)	0.58 (0.70)
	b6	sedge/veiny meadow rue	1144	1432	4	2580	0.81-0.58 (0.5-0.7)	0.67 (0.6)
	Ecosite phase	**g3_grazed graminoid meadow**						**1 (0.4)**
	d2	sedge-kentucky bluegrass/veiny meadow rue	1369	1245	2	2615	2-0.67 (0.2-0.6)	1 (0.4)
m rich fen subhydric/ rich	**Ecosite phase**	**m1 graminoid rich fen**						**0.47 (0.88)**
	b7	marsh reedgrass slough	1448	0	196	1644	0.81-0.34 (0.5-1.20)	0.4 (1.0)
	b8	water sedge meadow	2061	0	0	2061	2-0.3 (0.2-1.30)	0.54 (0.75)

*** = estimated production.**

ECOSITE PHASE C6 HAIRY WILD RYE GRASSLAND N=1


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
a
b
c
d
e
f
g
h
i
j
k
l
m
n

CHARACTERISTIC SPECIES

Shrub
- [7] prickly rose
- [1] snowberry*
- [4] saskatoon
- [2] dwarf bilberry*

Forb
- [40] bearberry
- [7] wild strawberry
- [6] smooth aster*
- [1] american vetch
- [5] common yarrow*
- [6] cream-colored vetchling*

Grass
- [3] purple oatgrass*
- [21] california oatgrass
- [14] carex spp.*
- [3] slender wheatgrass
- [2] kentucky bluegrass*
- [14] hairy wild rye*

SITE CHARACTERTISTICS

Moisture Regime: mesic
Nutrient Regime: medium
Topographic Position: level
Slope: (2-5)
Aspect: westerly[5], southerly[5]

PLANT COMMUNITY TYPES (N)

b2 california oatgrass/bearberry (1)

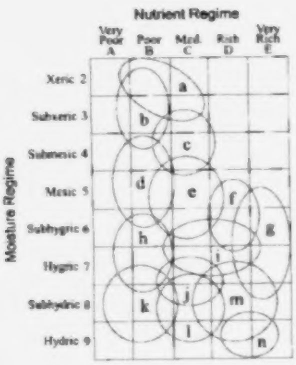
Ecological Status Score: 24

ECOLOGICALLY SUSTAINABLE STOCKING RATE

2.7 ha/AUM
0.15 AUM/ac

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

ECOSITE PHASE G3 GRAMINOID MEADOW N = 5


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
a
b
c
d
e
f
g
h
i
j
k
m
l
n

SITE CHARACTERTISTICS

Moisture Regime: mesic^2, subhygric^4, hygric^4
Nutrient Regime: medium^2, rich^4, very rich^4
Topographic Position: lower slope
Slope: (2-5)
Aspect: easterly^2, westerly^2, south westerly^6

PLANT COMMUNITY TYPES (N)

b6 tufted hairgrass-slender wheatgrass/veiny meadow rue (4)
Ecological Status Score: 24-16

b7 sedge/veiny meadow rue (1)
Ecological Status Score: 24

ECOLOGICALLY SUSTAINABLE STOCKING RATE

0.58 ha/AUM
0.70 AUM/ac

CHARACTERISTIC SPECIES

Shrub [1] currant*

Forb [21] veiny meadowrue
[4] common dandelion
[5] fireweed
[13] common yarrow
[11] tall lungwort
[9] american vetch
[6] rough cinquefoil*
[1] northern bedstraw
[4] wild strawberry
[4] Lindley's aster
[3] three-flowered avens*
[2] cream-colored vetchling*
[1] yellow avens*

Grass [2] kentucky bluegrass
[20] tufted hairgrass
[25] carex spp.
[8] slender wheatgrass
[3] smooth brome

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

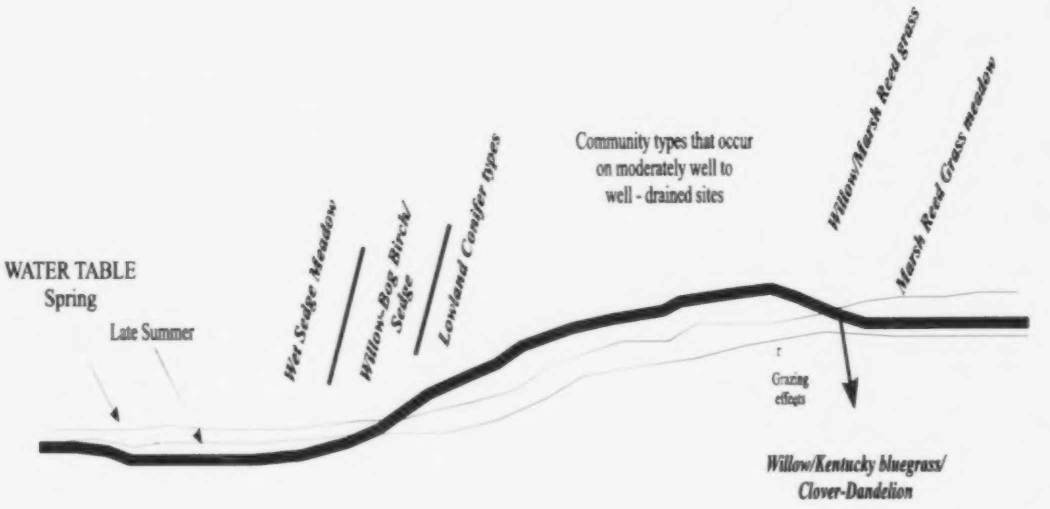

WATER TABLE
Spring
Late Summer
Wet Sedge Meadow
Willow-Bog Birch/Sedge
Lowland Conifer types
Community types that occur on moderately well to well - drained sites
Willow/Marsh Reed grass
Marsh Reed Grass meadow
Grazing effects
Willow/Kentucky bluegrass/Clover-Dandelion

Figure 2: Landscape profile of plant community types for shrublands and native grasslands in lowland areas of the Lower Foothills Subregion

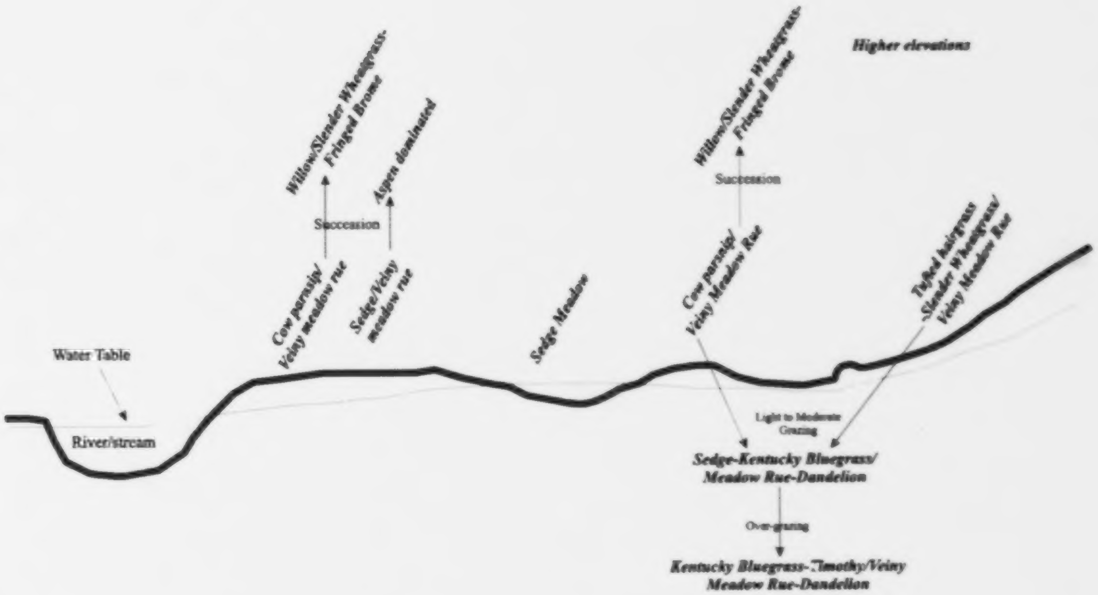

Willow/Slender Wheatgrass-
Fringed Brome
Aspen dominated
Succession
Cow parsnip/
Veiny meadow rue
Sedge/Veiny
meadow rue
Sedge Meadow
Willow/Slender Wheatgrass-
Fringed Brome
Succession
Cow parsnip/
Veiny Meadow Rue
Higher elevations
Tufted hairgrass
Slender Wheatgrass/
Veiny Meadow Rue
Water Table
River/stream
Light to Moderate
Grazing
Sedge-Kentucky Bluegrass/
Meadow Rue-Dandelion
Over-grazing
Kentucky Bluegrass-Timothy/Veiny
Meadow Rue-Dandelion

Figure 3: Landscape profile of plant community types for shrublands and native grasslands in riparian areas of the Lower Foothills Subregion

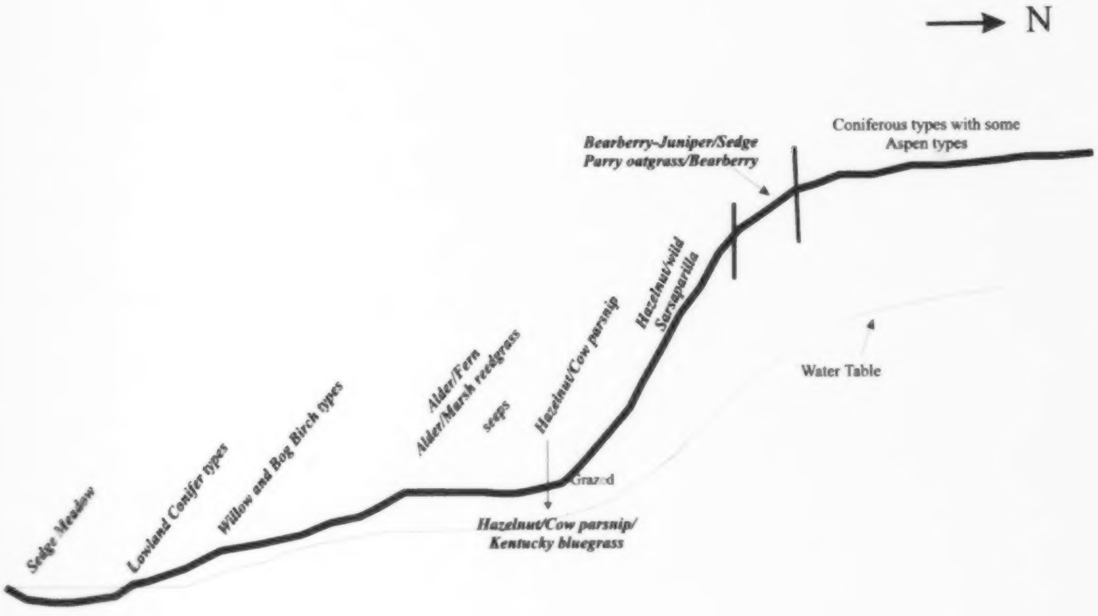

N
Coniferous types with some Aspen types
Bearberry-Juniper/Sedge
Parry oatgrass/Bearberry
Hazelnut/wild Sarsaparilla
Hazelnut/Cow parsnip
Water Table
Alder/Fern
Alder/Marsh reedgrass
seeps
Willow and Bog Birch types
Lowland Conifer types
Sedge Meadow
Grazed
Hazelnut/Cow parsnip/
Kentucky bluegrass

Figure 4: Landscape profile of plant community types for shrublands and native grasslands in upland areas of the Lower Foothills Subregion

Figure 5. Native Grass and Shrublands Key

1. Site is a dry upland grassland (site contains bearberry)........ 2
Site has a high moisture regime,(wetlands, moist meadows, shrublands,)........ 3

2. Steep south facing slope above rivers........ 4
Gentle slopes, native grasslands in the Saddle hills north of Grande Prairie........ **California oatgrass/Bearberry** b3

3. Sites dominated by shrubs........ 5
Sites are grassy or forb dominated meadows (with veiny meadow rue, tufted hairgrass, cow parsnip or grazed sites with Kentucky bluegrass)........ 15

4. Site dominated by Bearberry and Parry oatgrass, found on steep south facing slopes overlooking the Red Deer River west of Sundre........ **Bearberry/Parry oatgrass** b2
Site dominated by Bearberry, Juniper, and Sedges and is common on steep south facing rapidly drained slopes of river banks. Soils tend to be shallower than Parry oatgrass community described above........ **Bearberry-Juniper/Sedge**. b1

5. South and west slopes overlooking rivers and creeks throughout the lower foothills subregion........ **Snowberry-Saskatoon** c2
Wetland sites or if upland dominated by alder and hazelnut........ 6

6. Grazed and Ungrazed Wetland sites found in the valley bottoms or depressions (dominated by willow, bog birch, sedge, marsh reedgrass or Kentucky bluegrass)........ 10
Upland sites dominated by Bebb's willow, alder or hazelnut........ 7

7. Green alder or river alder dominated may have willow as co-dominant........ 9
Hazelnut dominated shrubland on south facing slopes........ 8

8. Well drained drier areas with wild sarsaparilla........ **Hazelnut/Wild sarsaparilla** c3
Moister areas with cow parsnip........ **Hazelnut/Cow parsnip/Kentucky bluegrass** d4

9. Mesic site, green alder dominated pipeline........ **Green alder/Creeping red fescue/clover** d3
Green alder, River alder dominated nutrient rich seepage area (co-dominated by Bebb's willow in overstory, fern present in understory)........ **Willow-Alder/Fern** c9

10. Ungrazed communities dominated by Willow and Bog Birch........ 11
Grazed communities with Kentucky bluegrass, clover and dandelion dominated understory... **Willow/Kentucky bluegrass/Clover** d5

11. Site is moist and rich and dominated by horsetails in understory........ **Willow/Horsetail** c8
Understory dominated by sedges, marsh reedgrass, slender wheatgrass, fringed brome, cow parsnip........ 12

12. Moist depressional areas associated with sedge and marsh reedgrass meadows........ 13
Better drained riparian communities dominated by tufted hairgrass, graceful sedge, fringed brome, slender wheatgrass in understory........ 14

13. Marsh reedgrass dominates understory........ **Willow/Marsh reedgrass** c7
Water sedge dominates understory........ **Willow-Bog birch/Water sedge** c10

14. Site is transitional between wet lowland and drier upland and is dominated by F. brome and S.wheatgrass in understory........ **Willow/Fringed Brome-Slender wheatgras.** c6
Higher elevation sites dominated by graceful sedge in understory........ **Willow-Bog birch/Graceful sedge** c4

15. Wetland depressional areas dominated by Sedge and Marsh reedgrass........ 16
Better drained riparian communities dominated by veiny meadow rue, cow parsnip, tufted hairgrass, graceful sedge, slender wheatgrass, fringed brome, Kentucky bluegrass........ 17

16. Very wet areas, dominated by water sedge........ **Wet sedge meadow** b8
Drier edges of sedge meadows dominated by marsh reedgrass........ **Marsh reedgrass meadow** b7

17. Ungrazed riparian communities dominated veiny meadow rue, cow parsnip, tufted hairgrass, graceful sedge, slender wheatgrass or fringed brome........ 18
Grazed riparian communities dominated by Kentucky bluegrass, clover, dandelion........ **K.bluegrass-Timothy/Meadow rue** d1/d2

18. Meadow dominated by Cow parsnip........ **Cow parsnip/V. Meadow rue** b4
Grass dominated meadows (tufted hairgrass, slender wheatgrass, fringed brome........ 19

19. Tufted hairgrass dominated meadow (higher elevations)........ **Tufted hairgrass-Slender wheatgrass/V.meadow rue** b5
Graceful sedge dominated meadows........ **Sedge/V.Meadow rue** b6

b1: Bearberry-Juniper/Sedge

(Arctostaphylos uva-ursi/Juniperus horizontalis/Carex spp.)

n=5 This community type is common on steep, south facing, rapidly drained slopes on the river banks of the Athabasca river and Solomon Creek near Hinton and Grande Cache. The parent materials are glacialfluvial, fluvial and morainal in origin. These grasslands can be considered an edaphic climax as the moisture limitations prevent the establishment of a tree canopy. On the moister sites with shallower slopes grass such as slender wheatgrass and northern wheatgrass can form a significant cover. On the steeper drier slopes there is little grass cover. These sites are generally too steep for livestock grazing, but horses may utilize these sites early in the spring when they are snow free.

PANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(*Populus tremuloides*)	2	0-5	60
SHRUBS			
JUNIPER			
(*Juniperus horizontalis*)	10	0-29	40
BUFFALOBERRY			
(*Shepherdia canadensis*)	8	0-16	80
ROSE			
(*Rosa acicularis*)	5	2-6	100
FORBS			
NORTHERN BEDSTRAW			
(*Galium borealis*)	3	1-6	100
CUT LV'D ANEMONE			
(*Anemone multifida*)	2	0-6	80
SMALL LEAVED EVERLASTING			
(*Antennaria parviflora*)	1	0-2	80
FRINGED SAGE			
(*Artemisia frigida*)	2	0-10	20
GRASSES			
JUNEGRASS			
(*Koeleria macrantha*)	1	0-4	80
SEDGE			
(*Carex spp*)	2	0-7	60
HAIRY WILDRYE			
(*Elymus innovatus*)	1	0-4	60
NORTHERN WHEATGRASS			
(*Agropyron dasystachyum*)	2	0-8	20

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: XERIC

NUTRIENT REGIME:
SUBMESOTROPHIC

SOIL DRAINAGE:
RAPIDLY

ELEVATION: 1089(914-1240)M

SLOPE: 35(10-80)%

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA)N=4

GRASS	112(50-200)
FORBS	252(68-504)
SHRUBS	144(20-326)
TOTAL	507(252-604)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM (40-3.37)
0.01 AUM/AC (0.01-0.12)

b2: Bearberry/Parry oatgrass

(Arctostaphylos uva-ursi/Danthonia parryi)

n=1 This community type was described on a steep south facing slope overlooking the Red Deer river west of Sundre. It is very similar to the previously described bearberry-juniper dominated community type. Parry oatgrass is common in the foothills of southwestern Alberta, and becomes rarer as one moves north of highway #1. The presence of this grass species indicates an affinity with the grasslands of southwestern Alberta. Willoughby et al. (2005) described a number of grassland communities along the Red Deer river valley that have similar species composition to the Montane grasslands of southern Alberta.

In general, this grassland is too steep and the soils too shallow to support a large amount of forage.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	10	-	100
SHRUBS			
PIN CHERRY *(Prunus pensylvanica)*	10	-	100
FLAT TOPPED SPIRAEA (*Spiraea betulifolia*)	3	-	100
ROSE (*Rosa acicularis*)	4	-	100
FORBS			
BASTARD'S TOADFLAX (*Commandra umbellata*)	3	-	100
STRAWBERRY (*Fragaria virginiana*)	7	-	100
LOW GOLDENROD (*Solidago multiradiata.*)	5	-	100
HAREBELL (*Campanula rotundifolia*)	2	-	100
GRASSES			
PARRY OATGRASS *(Danthonia parryi)*	7	-	100
SEDGE *(Carex spp)*	2	-	100
HAIRY WILDRYE (*Elymus innovatus*)	4	-	100
SLENDER WHEATGRASS (*Agropyron trachycaulum*)	7	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-XERIC

NUTRIENT REGIME: SUBMESOTROPHIC

SOIL DRAINAGE: WELL-RAPIDLY

ELEVATION: 1250 M

SLOPE:25%

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA): N=1

GRASS	18
FORBS	8
SHRUBS	60
TOTAL	86

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM (0.01-0.05)
0.01 AUM/AC (40-0.81)

b3: California oatgrass/Bearberry

(Danthonia californica/Arctostaphylos uva-ursi)

n=1 This community type was described in the Saddle hills northwest of Grande Prairie. This community is similar to the community described by Wilkinson and Johnson (1982) on darked colored solonetzic soils on gentle to level areas throughout the Dry Mixedwood subregion. Wilkinson and Johnson (1982), found there was a close correlation between large tracts of prairie vegetation and the distribution of solonetzic soils in the Peace River district of Alberta. They specifically described Western porcupine grass-Sedge/Fringed sage community on steep south -facing slopes and a Sedge-California oatgrass-Western porcupine grass on more gentle slopes. They felt the solonetzic soils supported grasslands and not forests because of their unfavourable ratios of Ca and Na, hard, columnar B-horizon, and relatively impermeable clay pan close to the surface. This community type appears to more similar to their Sedge-California oatgrass-Western porcupine grass community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(*Populus tremuloides*)	9	-	100
SHRUBS			
SASKATOON			
(*Amelanchier alnifolia*)	4	-	100
SNOWBERRY			
(*Symphoricarpos albus*)	1	-	100
ROSE			
(*Rosa acicularis*)	7	-	100
FORBS			
NORTHERN BEDSTRAW			
(*Galium boreale*)	6	-	100
STRAWBERRY			
(*Fragaria virginiana*)	9	-	100
ASTER SPP.			
(*Aster spp.*)	6	-	100
YELLOW PEAVINE			
(*Lathyrus ochroleucus*	6	-	100
GRASSES			
CALIFORNIA OATGRASS			
(*Danthonia californica*)	20	-	100
SEDGE			
(*Carex spp*)	14	-	100
HAIRY WILDRYE			
(*Elymus innovatus*)	14	-	100
PURPLE OATGRASS			
(*Schizachne purpurascens*)	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-MESIC

NUTRIENT REGIME:
SUBMESOTROPHIC-MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 910M

SLOPE:2%

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA)N=1

GRASS	444
FORBS	144
SHRUBS	64
TOTAL	652

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (4-2)
0.15 AUM/AC (0.1-0.2)

b4: Cow parsnip/Veiny Meadow Rue

(Heracleum lanatum/Thalictrum venulosum)

n=1 This community type occurs at higher elevations on moist, level valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is fairly high, but flooding is rare. The soils are nutrient rich and generally have a silty loam texture.

This community type is highly productive for both cattle and wildlife but, if left undisturbed, it will quickly be invaded by willow to form the Willow/Slender wheatgrass-Fringed brome(c5) community type . When this community is heavily utilized by livestock it is often invaded by timothy, Kentucky bluegrass and clover species.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	1	-	100
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	39	-	100
LINDLEY'S ASTER *Aster ciliolatus)*	1	-	100
STRAWBERRY *(Fragaria virginiana)*	4	-	100
TALL LUNGWORT *(Mertensia paniculata)*	13	-	100
COMMON YARROW *(Achillea millefolium)*	18	-	100
DANDELION *(Taraxacum officinale)*	1	-	100
COW PARSNIP *(Heracleum lanatum)*	13	-	100
FIREWEED *(Epilobium angustifolium)*	5	-	100
AMERICAN VETCH *(Vicia americana)*	3	-	100
GRASSES			
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO HYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION:1270 M
SLOPE: 0 - 2 %

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA)N=1

GRASS	1200
FORBS	800
SHRUBS	100
TOTAL	2100

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.58 HA/AUM (0.81-0.4)
0.7 AUM/AC (0.50-1.0)

b5: Tufted Hair Grass-Slender wheatgrass/Veiny Meadow Rue

(Deschampsia cespitosa-Agropyron trachycaulum/Thalictrum venulosum)

n=4 This community type occurs at higher elevations on moist, level, valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is usually high, but flooding is rare.

When these sites are protected from grazing, willow and bog birch expand, grasses decline, and taller forbs start to dominate. Past wildfires have played an important role in controlling shrub growth within this community type. Long-term heavy grazing pressure will lead to a community that is dominated by Kentucky bluegrass, clover and dandelion.

This community type is very similar to the tufted hair grass-dominated communities described in the Upper Foothills subregion (Willoughby 2005). The presence of tufted hair grass appears to indicate the transition to the Upper Foothills subregion.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
ROUGH CINQUEFOIL *(Potentilla norvegica)*	8	0-21	50
VEINY MEADOW RUE *(Thalictrum venulosum)*	22	2-37	100
COMMON YARROW *(Achillea millefolium)*	14	5-23	100
FIREWEED *(Epilobium angustifolium)*	3	0-13	25
LINDLEY'S ASTER *(Aster ciliolatus)*	3	1-9	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	9	2-17	100
SMOOTH ASTER *(Aster laevis)*	1	0-4	25
DANDELION *(Taraxacum officinale)*	3	0-7	75
NORTHERN BEDSTRAW *(Galium boreale)*	1	1-2	100
GRASSES			
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	25	4-41	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	1-21	100
SEDGE SPP. *(Carex spp.)*	17	4-41	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECTLY TO MOD. WELL

ELEVATION: 1313(1113-1415) M

SLOPE: 2(2-3) %

ASPECT: WESTERLY

ECOLOGICAL STATUS SCORE: 24

FORAGE PRODUCTION(KG/HA): N=1

GRASS	1355
FORBS	1670
SHRUBS	0
TOTAL	3025

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.58 HA/AUM (0.81-0.4)
0.7 AUM/AC (0.50-1.0)

b6: Sedge/ Veiny Meadow Rue

(Carex spp./ Thalictrum venulosum)

n=1 This community type was described on fluvial deposits adjacent to a creek in the Saddle Hills northwest of Grande Prairie. It is similar to the Cow parsnip/Veiny meadow rue community previously described, but lacks the cover of cow parsnip. The lack of cow parsnip and presence of aspen appears to indicate better drainage and poorer nutrients. It is likely that this community will succeed to an aspen dominated community in the absence of disturbance. This community is moderately productive and is easily accessible to livestock. It should be rated as primary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	8	-	100
SHRUBS			
GOOSEBERRY *(Ribes oxycanthoides)*	4	-	100
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	17	-	100
COMMON YARROW *(Achillea millefolium)*	10	-	100
AMERICAN VETCH *(Vicia americana)*	7	-	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	20	-	100
OLD MAN'S WHISKERS *(Geum triflorum)*	16	-	100
DANDELION *(Taraxacum officinale)*	6	-	100
FIREWEED *(Epilobium angustifolium)*	9	-	100
STRAWBERRY *(Fragaria virginiana)*	10	-	100
GRASSES			
SEDGE *(Carex spp.)*	61	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	-	100
FRINGED BROME GRASS *(Bromus ciliatus)*	12	-	100
HAIRY WILDRYE *(Elymus innovatus)*	8	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 910 M

ECOLOGICAL STATUS SCORE: 24 OR 16

FORAGE PRODUCTION(KG/HA):N=1

GRASS	1144
FORBS	1432
SHRUBS	4
TOTAL	2580

ECOLOGICALLY SUSTAINABLE STOCKING RATE

0.67 HA/AUM (0.81-0.58)

0.6 AUM/AC (0.50-0.7)

b7: Marsh Reed Grass Slough

(Calamagrostis canadensis)

n=1 This community type occurs on very moist, depressional areas. It will occur on the fringes around marshes or sedge meadows and in the center of willow rings on upland sites. Unlike sedge meadows, these areas are only flooded in the spring and early summer; which allows marsh reed grass to dominate instead of sedges.

This community type is productive and livestock useage may occur during the later part of summer when the area dries out and access improves.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	9	-	100
FORBS			
FIREWEED			
(Epilobium angustifolium)	5	-	100
FIELD HORSETAIL			
(Equisetum arvense)	1	-	100
GRASSES			
MARSH REED GRASS			
(*Calamagrostis canadensis)*	95	-	100
MOSSES			
MOSS SPP.	16	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC TO EUTROPHIC

SOIL DRAINAGE:
IMPERFECTLY TO POORLY

ELEVATION: 914 M

SLOPE: N/A

ECOLOGICAL STATUS SCORE: 24

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA): N=1

TOTAL 2000*

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.4 HA/AUM (0.81-0.34)
1.0 AUM/AC (0.50-1.20)

b8: Wet Sedge Meadow

(Carex aquatalis - Carex rostrata)

n=2 This community type is found in areas that are flooded for most of the growing season. It occurs on wetter sites than the Marsh Reed Grass community type. Succession within this community type is very slow and proceeds with organic matter accumulations (Beckingham 1994). Therefore, this community type can be considered the potential natural vegetation for the site.

Although this community type is very productive, the wet soil conditions which may make livestock access difficult.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	1	0-2	50
FORBS			
WILD LILY-OF-THE-VALLEY			
(*Maianthemum canadense*)	1	0-1	50
GRASSES			
WATER SEDGE			
(*Carex aquatilis)*	51	22-80	100
BEAKED SEDGE			
(Carex rostrata)	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC - EUTROPHIC

SOIL DRAINAGE:
POORLY TO VERY POORLY

ELEVATION: 1133(975 - 1290) M

ECOLOGICAL STATUS SCORE: 24

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA):N=2

GRASS	2061(2042-2079)
FORBS	0
SHRUBS	0
TOTAL	2061(2042-2079)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.54 HA/AUM (2-0.3)
0.75 AUM/AC (0.2-1.30)

NATIVE SHRUBLANDS

OF THE

LOWER FOOTHILLS SUBREGION

Photo 7: This photo of the Baptiste River illustrates a progression of communities from wetter areas near the river to drier communities at the edge where willow communities predominate.

Table 6. Forage production summary for native shrublands of the Lower Foothills subregion

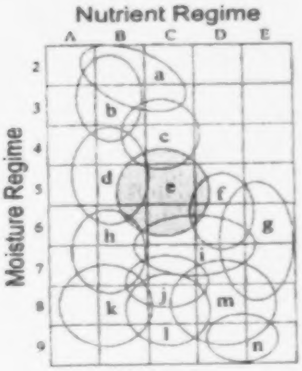
		Forage productivity(kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
Ecological site	Community type	Grass	Forb	Shrub	Total	Range	Recommended
c hairy wild rye submesic/medium	**Ecosite phase c5 shrubland**						**2.7 (0.15)**
	c1 rose-blueberry/schreber's moss	92	176	984	1252	4-1.35 (0.1-0.3)	2.7 (0.15)
e low-bush cranberry mesic/medium	**Ecosite phase e5 shrubland**						**2.35 (0.18)**
	c2 snowberry-saskatoon	94	359	222	675	4-1.62 (0.1-0.25)	2.7 (0.15)
	c3 hazelnut/wild sarsaparilla	1057	1289	530	2876	10-0.58 (0.04-0.7)	2 (0.2)
	Ecosite phase e5_grazed shrubland						**067 (0.6)**
	d3 alder/creeping red fescue/clover	2644	342	480	3466	2-0.4 (0.2-1.0)	0.67 (0.6)
f bracted honey-suckle subhygric/ rich	**Ecosite phase f5 shrubland**						**1.0 (0.40)**
	c4 willow-bog birch/graceful sedge	1125	372	388	1885	40-0.67 (0.01-0.60)	1.0 (0.40)
	Ecosite phase f5_grazed shrubland						**2 (0.2)**
	d4 hazelnut/cowparsnip/kentucky bluegrass	164	1066	446	1676	10-0.58 (0.04-0.7)	2 (0.2)
g meadow subhygric/very rich	**Ecosite phase g1 shrubby meadow**						**0.91 (0.45)**
	c5 willow/slender wheatgrass-f. brome	1467	842	264	2573	40-0.4 (0.01-0.10)	1.0 (0.40)
	c6 willow/marsh reedgrass	2204	820	0	3024	40-0.4 (0.01-1.00)	0.81 (0.50)

	Ecosite phase	**g1_grazed shrubby meadow**						**4 (0.1)**
	d5	willow/kentucky bluegrass/clover	1325	787	53	2165	4-0.81 (0.1-0.5)	4 (0.1)
i horsetail hygric/rich	**Ecosite phase**	**i4 shrubland**						**15 (0.20)**
	c7	alder/marsh reedgrass	2386	1350	46	3782	40-4 (0.01-1.0)	0.81 (0.50)
	c8	willow/horsetail	130	207	60	397	40-2 (0.01-0.2)	40 (0.01)
	c9	willow-alder/fern	124	333	378	835	40-1.35 (0.01-0.3)	4 (0.1)
m rich fen subhydric/ rich	**Ecosite phase**	**m2 shrubby rich fen**						**0.81 (0.5)**
	c10	willow-bog birch/water sedge	1631	1120	371	3048	40-4 (0.01-1.0)	0.81 (0.5)

*estimate

ECOSITE PHASE E5 SHRUBLAND

e5 low-bush cranberry n=6



CHARACTERISTIC SPECIES

Shrub
[1] willow*
[7] wild red raspberry
[6] prickly rose
[7] snowberry*
[5] saskatoon
[2] beaked hazelnut*

Forb
[2] fireweed
[12] wild sarsaparilla*
[1] wild strawberry
[6] showy aster*
[3] tall lungwort
[3] northern bedstraw
[3] american vetch
[1] veiny meadowrue
[1] cream-colored vetchling*
[1] dandelion*

Grass
[3] marsh reedgrass
[5] carex spp.*
[5] slender wheatgrass
[3] fringed brome
[2] kentucky bluegrass*
[1] hairy wild rye*

SITE CHARACTERTISTICS

Moisture Regime: submesic^3, mesic^5, hygric^2
Nutrient Regime: medium^{10}
Topographic Position: lower slope^2, mid slope^2, upper slope^6
Slope: (6-9)^2, (10-15)^4, (16-30)^2
Aspect: easterly^2, southerly^8

Ecological Status Score: 24-18

PLANT COMMUNITY TYPES (N)

c2 snowberry-saskatoon (1)
Ecological Status Score: 24 or 18

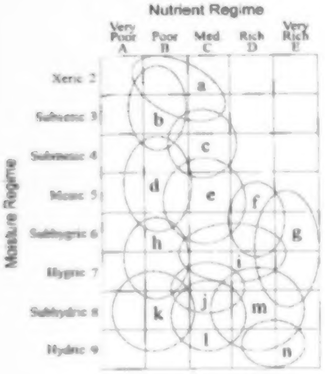
c3 hazelnut/wild sarsaparilla (2)
Ecological Status Score: 24

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.35 HA/AUM
0.18 AUM/AC

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

ECOSITE PHASE G1

g1 shrubby meadow grazed n = 16


Nutrient Regime
Very Poor A
Poor B
Med C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
a
b
c
d
e
f
g
h
i
j
k
l
m
n

CHARACTERISTIC SPECIES

Shrub [40] willow
[2] bog birch*
[1] currant*

Forb [22] clover spp.
[12] common dandelion
[7] veiny meadowrue
[6]star-floweredfalseSolomons-seal*
[5] Lindley's aster
[3] wild red strawberry
[3] common yarrow
[2] northern bedstraw*
[2] american vetch*
[2] tall buttercup*
[1] tall lungwort*
[1] stinging nettle*

Grass[23] kentucky bluegrass
[5] marsh reedgrass*
[4] slender wheatgrass
[4] carex spp.
[4] timothy
[2] tufted hairgrass*

SITE CHARACTERTISTICS

Moisture Regime: mesic^{2}, subhygric^{4}, hygric^{4}
Nutrient Regime: medium^{6}, rich^{4}
Topographic Position: lower slope
Slope: (2-5)
Aspect: south westerly

SOIL CHARACTERISTICS

Organic Thickness: (6-15)^{8}, (0-5)^{2}
Humus form: mull^{5}, mor^{3}, raw moder^{2}
Surface Texture: SiC^{4}, SiL^{1}, SL^{1}
SCL^{1}, L^{1}, CL^{1}
Effective Texture: SiC^{5}, SiL^{1}, SiCL^{1}, SL^{1}, SL^{1}, SCL^{1}
Depth to Mottles/Gley: (0-25)^{5}, (51-100)^{3}, (26-50)^{3}
Drainage: imperfect^{6}, poor^{4}
Parent Material: F^{9}, M^{1}
Soil Subgroup: R.HG^{4}, O.R^{3}, R.G^{1}, O.G^{1}, GLCU.R^{1}
Soil type: SWm^{5}, SWp^{3}, SM4^{2}

Ecological Status Score: 8 - 0

PLANT COMMUNITY TYPES (N)

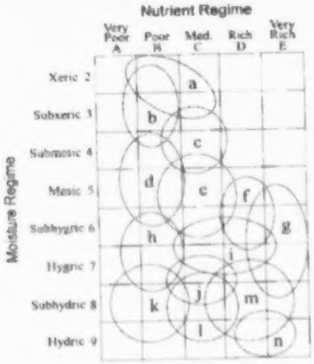
d5 willow/kentucky bluegrass/clover (9)
Ecological Status Score: 8 - 0

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4HA/AUM
0.1 AUM/AC

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.
** Soil Characteristics are from g1 shrubby meadow Ecosite Phase summary.

ECOSITE PHASE I4

i4 horsetail shrubland n =5


Nutrient Regime
Very Poor A
Poor B
Med. C
Rich D
Very Rich E
Moisture Regime
Xeric 2
Subxeric 3
Submesic 4
Mesic 5
Subhygric 6
Hygric 7
Subhydric 8
Hydric 9
a
b
c
d
e
f
g
h
i
j
k
m
l
n

CHARACTERISTIC SPECIES

Shrub [28] willow spp.
- [17] river alder
- [14] bracted honeysuckle
- [6] green alder
- [5] low-bush cranberry
- [4] currant spp.
- [6] wild red raspberry
- [2] prickly rose*

Forb [9] cowparsnip
- [7] common horsetail
- [5] spiny wood fern*
- [4] dewberry
- [3] red and white baneberry
- [4] tall lungwort
- [3] wild sarsaparilla*
- [6] fireweed*
- [2] stinging nettle*
- [2] large-leaved avens*
- [1] Lindley's aster

Grass[29] marsh reedgrass
- [2] carex spp.
- [2] fringed brome

SITE CHARACTERTISTICS

Moisture Regime: hygric^{10}
Nutrient Regime: rich^{10}
Topographic Position: lower slope
Slope: (2-5)
Aspect: north^{5}, northeasterly^{5}
Ecological Status Score: 24

PLANT COMMUNITY TYPES (N)

c8 alder/marsh reedgrass(1)
Ecological Status Score: 24

c9 willow/horsetail (1)
Ecological Status Score: 24

c10 willow-alder/horsetail (4)
Ecological Status Score: 24

ECOLOGICALLY SUSTAINABLE STOCKING RATE
15HA/AUM
0.2 AUM/AC

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.
** Soil Characteristics are from g1 shrubby meadow Ecosite Phase summary.

c1: Rose-Blueberry/Schreber's moss

(Rosa acicularis-Vaccinium cespitosa/Pleurozium schreberi)

n=1 This community type occurs in small isolated openings within the aspen dominated forests of the Saddle Hills northwest of Grande Prairie. These sites appear to have gravelly, well drained soils which inhibit the growth of trees and allow shrubs such as rose and blueberry to dominate. This community is moderately productive, with the majority of the production coming from shrubs which are moderately palatable to livestock.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREE			
ASPEN (*Populus tremuloides*)	3	-	100
SHRUBS			
WILLOW *(Salix spp.)*	3	-	100
ROSE *(Rosa acicularis)*	29	-	100
BLUEBERRY (*Vaccinium caespitosum*)	17	-	100
BUFFALOBERRY (*Shepherdia canadensis*)	10	-	100
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	15	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	1	-	100
DANDELION *(Taraxacum offincinale)*	7	-	100
YARROW *(Achillea millefolium)*	6	-	100
GRASSES			
HAIRY WILDRYE *(Elymus innovatus)*	8	-	100
MARSH REED GRASS *(Calamagrostis canadensis)*	1	-	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	5	-	100
FRINGED BROME GRASS *(Bromus ciliatus)*	1	-	100
MOSSES			
Moss spp.	44	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC-SUBMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION:910 M

ECOLOGICAL STATUS SCORE: 24 OR 18

FORAGE PRODUCTION(KG/HA):N=1

GRASS	92
FORBS	176
SHRUBS	984
TOTAL	1252

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (4-1.35)
0.15 AUM/AC (0.1-0.3)

c2: Snowberry-Saskatoon

(Symphoricarpos occidentalis-Amelanchier alnifolia)

n=1 This community type is found on south and west facing slopes overlooking rivers and creeks throughout the Lower Foothills subregion. These sites are generally well drained, and appear to have a slightly higher nutrient regime than the modal mesic/medium sites. It is possible that these sites receive some nutrient rich seepage at sometime during the year. Succession in the absence of disturbance is to an Aw/Saskatoon or Aw/Snowberry community type. These community types are moderately productive, but the steep slopes, and high shrub cover generally restrict their use by livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	8	-	100
SHRUBS			
CHOKECHERRY *(Prunus virginiana.)*	6	-	100
SASKATOON *(Amelanchier alnifolia)*	12	-	100
ROSE *(Rosa acicularis)*	1	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	20	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	2	-	100
SHOWY ASTER *(Aster conspicuus)*	3	-	100
NORTHERN BEDSTRAW *(Galium boreale)*	5	-	100
COMMON YARROW *(Achillea millefolium)*	3	-	100
GRASSES			
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	-	100
UPLAND SEDGE *(Carex spp.)*	15	-	100
FRINGED BROME *(Bromus ciliatus)*	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC-PERMESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 643 M
SLOPE: 35%
ASPECT: SOUTH

ECOLOGICAL STATUS SCORE: 24 OR 18

FORAGE PRODUCTION(KG/HA):N=1

GRASS	94
FORBS	359
SHRUBS	222
TOTAL	675

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (4-1.62)
0.15 AUM/AC (0.1-0.25)

c3: Hazelnut/Wild sarsaparilla

(Corylus cornuta/Aralia nudicaulis)

n=2 This community type occurs in small isolated openings within the aspen dominated forests near Whitecourt Mountain southwest of Whitecourt. These sites occur on south and west facing slopes. These sites were probably created after a fire burned through the area and the higher insolation has limited tree growth. On moister, lower slope positions cow parsnip can dominate this community type. These sites are moderately productive but the high shrub cover generally restricts their use by livestock. Succession in the absence of disturbance will be to aspen.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	8	6-10	100
Shrubs			
HAZELNUT			
(Corylus cornuta.)	3	2-3	100
Rose			
(Rosa acicularis)	5	4-5	100
FORBS			
WILD SARSAPARILLA			
(Aralia nudicaulis)	17	16-18	100
LINDLEY'S ASTER			
(Aster ciliolatus)	2	1-4	100
SHOWY ASTER			
(Aster conspicuus)	8	6-9	100
CANADA VIOLET			
(Viola canadensis)	4	1-7	100
TALL LUNGWORT			
(Mertensia paniculata)	4	1-7	100
FIREWEED			
(Epilobium angustifolium)	3	1-3	100
WILD STRAWBERRY			
(Fragaria virginiana)	1	0-2	50
DOGBANE			
(Apocynum androsaefolium)	6	0-11	50
GRASSES			
FRINGED BROME			
(Bromus ciliatus)	6	1-10	100
MARSH REED GRASS			
(Calamagrostis canadensis)	5	3-6	100
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	2	1-2	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	3	0-5	50

ENVIRONMENTAL VARIABLES

Moisture Regime: mesic

Nutrient Regime: mesotrophic-Permesotrophic

Soil Drainage: Well

Elevation:1050 m

Slope: 17%

Aspect: southerly

Ecological status score: 24 or 18

forage production(kg/ha):n=2

Grass	1057(716-1398)
Forbs	1289(966-1611)
Shrubs	530(434-626)
Total	2876(2798-2953)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 HA/AUM (10-0.58)
0.20 AUM/AC (0.04-0.7)

c4: Willow-Bog Birch/ Graceful sedge

(Salix spp. - Betula glandulosa/ Schizachne purpurascens)

n=22 This community type is drier than the Willow/Marsh Reed Grass or Willow-Bog birch/Water sedge community types. The water table is high enough on this community type to support the growth of willow and bog birch, but there is good drainage at the surface that favors the growth of mesic grass and forb species (hairy wildrye, graceful sedge, purple oatgrass, yellow peavine and fireweed). Livestock can usually easily access these sites. Therefore this community should be rated as primary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	27	2-60	100
BOG BIRCH *(Betula glandulosa)*	40	0-80	86
FORBS			
STRAWBERRY *(Fragaria virginiana)*	4	0-17	52
LINDLEY'S ASTER *(Aster ciliatus)*	2	0-15	44
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	0-10	52
FIREWEED *(Epilobium angustifolium)*	1	0-10	39
COMMON YARROW *(Achillea millefolium)*	1	0-5	61
YELLOW PEAVINE *(Lathyrus ochroleucus)*	2	0-10	44
GRASSES			
PURPLE OAT GRASS *(Schizachne purpurascens)*	5	0-38	39
UPLAND SEDGE *(Carex spp.)*	25	0-50	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-8	57
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	0-32	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC-PERMESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1203(914-1572) M
SLOPE: 0 - 7%
ASPECT: VARIABLE
ECOLOGICAL STATUS SCORE: 24
HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA):N=6

GRASS	1125(230-2872)
FORBS	372(4-890)
SHRUBS	388(0-780)
TOTAL	1885(704-2900)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.0 HA/AUM (40-0.67)
0.40 AUM/AC (0.01-0.60)

c5: Willow/Slender Wheat Grass-Fringed Brome Grass

(Salix spp./Agropyron trachycaulum-Bromus ciliatus)

n=6 This community type occurs at higher elevations on moist, level valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is fairly high, but flooding is rare.

A variant of this community type, the Cow parsnip/Veiny Meadow rue community type, is common along the Baptiste River at the upper elevational limit of the Lower Foothills subregion. The Cow parsnip/Veiny Meadow rue community type is highly productive for both cattle and wildlife but, if left undisturbed, it will quickly be invaded by willow to form this community type. Willow density may limit the potential for grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	58	37-90	100
BOG BIRCH			
(Betula glandulosa)	3	0-10	67
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	9	0-39	83
LINDLEY'S ASTER			
(Aster ciliolatus)	9	0-27	83
TALL LUNGWORT			
(Mertensia paniculata)	11	0-19	83
VEINY MEADOW RUE			
(Thalictrum venulosum)	10	0-35	83
TALL LARKSPUR			
(Delphinium glaucum)	5	0-5	83
CREAM COLOURED VETCHLING			
(Lathyrus ochroleucus)	1	0-2	50
FIREWEED			
(Epilobium angustifolium)	4	0-7	83
GRASSES			
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	11	4-22	100
FRINGED BROME			
(Bromus ciliatus)	8	3-12	100
GRACEFUL SEDGE			
(Carex praegracilis.)	4	0-7	83
MARSH REED GRASS			
(Calamagrostis canadensis)	7	0-23	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL TO MOD. WELL

ELEVATION: 1073(853-1220) M

SLOPE: N/A

ECOLOGICAL STATUS SCORE: 24

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA)N=6

GRASS	1467(156-4088)
FORBS	842(422-1186)
SHRUBS	264(0-766)
TOTAL	2573(946-4646)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.0 HA/AUM(40-0.4)
0.4 AUM/AC (0.01-1.0)

c6: Willow/ Marsh Reed Grass

(Salix spp./ Calamagrostis canadensis)

n=10 This community type occurs as small willow pockets in depressions on upland sites and as a transitional community type between wet lowland community types and drier upland community types. It occurs in areas where the water table is high in the spring (with frequent flooding).

As organic matter accumulates and these sites begin to dry out, black spruce, tamarack, balsam poplar, or paper birch may establish (Beckingham 1993). These community types tend to persist for long periods of time before they undergo succession to forest.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	46	10-80	100
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	5	0-31	50
WILD RED RASPBERRY			
(Rubus idaeus)	8	0-40	50
FORBS			
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-13	70
YELLOW AVENS			
(Geum aleppicum)	2	0-11	20
STINGING NETTLE			
(Urtica dioica)	6	0-30	40
COMMON YARROW			
(Achillea millefolium)	2	0-9	60
VEINY MEADOW RUE			
(Thalictrum venulosum)	2	0-8	40
FIELD HORSETAIL			
(Equisetum arvense)	1	0-1	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	27	0-80	90
WATER SEDGE			
(Carex aquatilis)	1	0-10	20
KENTUCKY BLUEGRASS			
(Poa pratensis)	1	0-9	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY TO IMPERFECTLY

ELEVATION: 915(818-1205) M

SLOPE:N/A

ECOLOGICAL STATUS SCORE: 40

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA): N=2

GRASS	2204(688-3720)
FORBS	820(742-898)
SHRUBS	0
TOTAL	3024(1586-4462)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.81 HA/AUM (40-0.4)
0.5 AUM/AC (0.01-1.0)

c7: Alder/Marsh reedgrass

(Alnus crispa/Calamagrostis canadensis)

n=1 This community type was described on north and east facing slopes West of Sundre. This community appears to occupy areas that receive some nutrient rich seepage throughout the growing season. There are some trees growing on these sites, but they are generally restricted to the drier areas. This community is similar to the Alder/Fern community that was described on nutrient rich seepage areas in the Saddle Hills, but this type lacks the cover of fern. This community type is very productive, but it is difficult to graze because of the slope and the high cover of alder which restricts livestock movement.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	2	-	100
WHITE SPRUCE *(Picea glauca)*	2	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa.)*	36	-	100
RED RASPBERRY *(Rubus ideaus)*	18	-	100
WILLOW *(Salix bebbiana)*	5	-	100
FORBS			
FIREWEED *(Epilobium angustifolium)*	25	-	100
COW PARSNIP *(Heracleum lanatum)*	3	-	100
STINGING NETTLE *(Urtica dioica)*	4	-	100
TALL LUNGWORT *(Mertensia paniculata)*	4	-	100
GRASSES			
FOWL BLUEGRASS *(Poa palustris)*	8	-	100
MARSH REED GRASS *(Calamagrostis canadensis)*	26	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION:1300 M

SLOPE: 10%

ASPECT: EASTERLY

ECOLOGICAL STATUS SCORE: 24 OR 18

FORAGE PRODUCTION(KG/HA) N=1

GRASS	2386
FORBS	1350
SHRUBS	46
TOTAL	3782

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.81 HA/AUM(40-4)
0.5 AUM/AC (0.01-1.0)

c8: Willow/ Horsetail

(Salix spp./ Equisetum arvense)

n=1 This community type appears to be transitional between the horsetail (hygric/rich) and shrubby rich fen (subhydric/rich) ecosites described by Beckingham and Archibald (1996). It has plant species characteristic of both ecosites. Horsetail the principal forage species is generally unpalatable to domestic livestock and can be poisonous to livestock in large amounts (Lodge et al 1968).

PLANT COMPOSITION

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	55	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	19	-	100
ROSE *(Rosa acicularis)*	5	-	100
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	2	-	100
YELLOW AVENS *(Geum macrophyllum)*	11	-	100
COW PARSNIP *(Heracleum lanatum)*	6	-	100
TWINFLOWER *(Linnaea borealis)*	10	-	100
FIELD HORSETAIL *(Equisetum arvense)*	18	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	28	-	100
SEDGE *(Carex spp)*	4	-	100
FRINGED BROME *(Bromus ciliatus)*	6	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY TO IMPERFECTLY

ELEVATION: 915(818-1205) M

SLOPE:N/A

ECOLOGICAL STATUS SCORE: 24

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA):N=1

GRASS	130
FORBS	207
SHRUBS	60
TOTAL	397

ECOLOGICALLY SUSTAINABLE STOCKING RATE

40HA/AUM (40-2)

0.01 AUM/AC (0.01-0.2)

c9: Willow-Alder/Fern

(Salix spp.-Alnus crispa/Dryopteris carthusiana)

n=4 This community type was described on north and east facing slopes in the Saddle Hills northwest of Grande Prairie. This community appears to occupy areas that receive some nutrient seepage throughout the growing season. There are some trees growing on these sites, but they are generally restricted to the drier areas. This community is similar to the Alder/Marsh reedgrass community that was described on nutrient rich seepage areas in the Lower Foothills subregion west of Sundre. This community type is very productive, but it is difficult to graze because of the slope and the high cover of alder and willow which restricts livestock movement.

Plant Composition Canopy Cover(%)

	Mean	Range	Const.
Trees			
Balsam poplar (*Populus balsamifera*)	3	0-10	25
Shrubs			
Green alder *(Alnus crispa.)*	9	0-35	50
River alder *(Alnus tenuifolia)*	42	0-65	75
Willow (*Salix bebbiana*)	33	12-65	100
Bracted honeysuckle (*Lonicera involcrata*)	16	8-30	100
Forbs			
Field horsetail *(Equisetum arvense)*	6	1-9	100
Cow parsnip *(Heracleum lanatum)*	11	0-33	75
Baneberry *(Actaea rubra)*	5	0-15	75
Shield fern *(Dryopteris carthusiana)*	7	0-28	25
Oak fern (*Gymnocarpium dryopteris*)	1	0-2	25
Grasses			
Fringed brome *(Bromus ciliatus)*	1	0-4	25
Marsh Reed Grass *(Calamagrostis canadensis)*	29	0-74	75

Environmental Variables

Moisture Regime: Subhydric

Nutrient Regime: Permesotrophic

Soil Drainage: Moderately well

Elevation: 855(850-860) m

Slope: 8(3-12)%

Aspect: Easterly, northerly

Ecological Status score: 24

Health form: Riparian

FORAGE PRODUCTION(KG/HA):N=2

Grass	124(0-248)
Forbs	333(72-594)
Shrubs	378(84-672)
Total	835(156-1514)

Ecologically Sustainable Stocking Rate

4 ha/AUM (40-1.35)
0.1 AUM/ac (0.01-0.3)

c10: Willow-Bog birch/Water sedge

(Salix spp.-Betula glandulosa/Carex aquatilis)

n=15 This community type is found along the edges of sedge meadows and in moist depressions. Willow becomes established at the edges of the sedge meadow due to the shorter duration of standing water. Increased flooding and prolonged water logging may result in the disappearance of willow and a transition to a water sedge meadow. As organic matter accumulates these sites dry out, black spruce, tamarack, balsam poplar or paper birch establish (Beckingham 1993). Indeed this process had started to occur on some of described sites. These sites are fairly productive but difficult to graze due to the moist ground conditions and heavy shrub cover which reduces access and mobility within the area.

PLANT COMPOSITIONCANOPYCOVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE (*Picea mariana*)	2	0-3	33
SHRUBS			
BOG BIRCH *(Betula glandulosa.)*	30	0-91	80
WILLOW (*Salix bebbiana*)	25	0-50	86
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	1	0-3	33
STRAWBERRY *(Fragaria virginiana)*	2	0-18	33
DWARF RASPBERRY *(Rubus arcticus)*	2	0-13	53
PURPLE AVENS *(Geum rivale)*	2	0-27	27
GRASSES			
WATER SEDGE *(Carex aquatilis)*	22	0-57	80
MARSH REED GRASS *(Calamagrostis canadensis)*	6	0-54	73
BEAKED SEDGE (*Carex rostrata*)	18	0-80	53

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY

ELEVATION: 1108(853-1450)) M

SLOPE: 8(3-12)%

ASPECT: EASTERLY, NORTHERLY

ECOLOGICAL STATUS SCORE: 24

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA):N=5

GRASS	1631(198-3792)
FORBS	1120(65-3518)
SHRUBS	371(0-744)
TOTAL	3048(1062-4826)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.81 HA/AUM (40-4)
0.5 AUM/AC (0.01-1.0)

GRAZED MODIFIED

SHRUBLANDS AND NATIVE GRASSLANDS

OF THE

LOWER FOOTHILLS SUBREGION

Photo 8: A grazed native shrub and grassland transition within the Lower Foothills (i.e. kentucky bluegrass and clover have invaded).

d1: Kentucky Bluegrass - Timothy/ Veiny Meadow Rue

(Poa pratensis - Phleum pratense/ Thalictrum venulosum)

n=8 This community type results from continued heavy grazing of a Cow parnsip/Veiny Meadow Rue(b4) community type. It will move towards a Kentucky Bluegrass/Clover - Dandelion community type if the heavy grazing pressure continues.

Although this community type is considered to be productive for domestic livestock, the Ecological Status Score 12 has been reduced on these sites to allow for recovery.

PLANT COMPOSITION

CANOPY COVER(%)	MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	1	0-6	25
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	22	0-46	83
DANDELION *(Taraxacum officinale)*	19	5-29	100
AMERICAN VETCH *(Vicia americana)*	7	2-10	100
NORTHERN BEDSTRAW *(Galium boreale)*	6	1-12	100
COMMON YARROW *(Achillea millefolium)*	6	3-9	100
CANADA GOLDENROD *(Solidago canadensis)*	6	0-28	63
COW PARSNIP *(Heracleum lanatum)*	5	0-12	88
FIREWEED *(Epilobium angustifolium)*	4	0-13	63
TALL LARKSPUR *(Delphinium glaucum)*	4	0-17	50
CHICKWEED *(Cerastium arvense)*	3	0-13	50
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-7	88
CREAM COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	0-3	88
STRAWBERRY *(Fragaria virginiana)*	2	0-4	88
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	2	1-4	100
GRASSES			
TIMOTHY *(Phleum pratense)*	13	0-46	63
KENTUCKY BLUEGRASS *(Poa pratensis)*	44	6-77	100
BEAKED SEDGE *(Carex rostrata)*	8	0-20	75
FRINGED BROME GRASS *(Bromus ciliatus)*	7	0-20	63
UPLAND SEDGE *(Carex spp.)*	6	0-27	63
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	0-11	75
SMOOTH BROME GRASS *(Bromus inermis)*	4	0-24	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1130(1066 - 1176) M
SLOPE: 0 -1%
ASPECT: EASTERLY
ECOLOGICAL STATUS SCORE: 8 - 0

FORAGE PRODUCTION(KG/HA):N=1

GRASS	1190
FORBS	614
SHRUBS	1042
TOTAL	2846

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.81 HA/AUM (2-0.58)
0.5 AUM/AC (0.2-0.7)

d2: Sedge - Kentucky Bluegrass/ Veiny meadow rue

(Carex spp - Poa pratensis/ Thalictrum venulosum)

n=2 This community type has developed from heavy grazing a Sedge/Veiny meadow rue (b6) community type, and then resting it for an extended period of time. Heavy prolonged grazing pressure has allowed kentucky bluegrass and dandelion to invade the site. Continued rest has allowed the site to recover and sedge, veiny meadow rue and other native species have increased in cover. Kentucky bluegrass is a very persistent species on these sites and the cover of Kentucky bluegrass will likely remain quite high with continued rest.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	1	0-1	50
SHRUBS			
WILLOW *(Salix bebbiana)*	3	0-5	50
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	26	25-26	100
DANDELION *(Taraxacum officinale)*	27	24-29	100
NORTHERN BEDSTRAW *(Galium boreale)*	4	1-8	100
COMMON YARROW *(Achillea millefolium)*	7	4-9	100
TALL LARKSPUR *(Delphinium glaucum)*	5	1-8	100
YELLOW AVENS *(Geum aleppicum)*	4	0-8	50
TALL LUNGWORT *(Mertensia paniculata)*	10	7-13	100
AMERICAN VETCH *(Vicia americana)*	7	5-8	100
STRAWBERRY *(Fragaria virginiana)*	3	1-4	100
CREAM COLOURED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	50
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1	0-1	50
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	9	0-18	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	8	0-16	50
TIMOTHY *(Phleum pratense)*	2	0-2	50
SMOOTH BROME GRASS *(Bromus inermis)*	5	0-10	50
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	1-5	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME:
PERMESOTROPHIC

SOIL DRAINAGE: MOD. WELL TO WELL

ELEVATION: 1131(1122-1140) M

SLOPE: 2%

ASPECT: SOUTH

ECOLOGICAL STATUS SCORE: 8

FORAGE PRODUCTION(KG/HA):N=2

GRASS	1369(462-2275)
FORBS	1245(1124-1365)
SHRUBS	2(0-4)
TOTAL	2615(2042-2079)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1 HA/AUM (2-0.67)
0.4 AUM/AC (0.2-0.6)

d3: Green Alder/ Creeping Red Fescue/ Clover

(Alnus crispa/ Festuca rubra/ Trifolium pratense)

n=1 This community type was described on a pipeline that had been seeded to creeping red fescue and clover in a area north of Nojack. Alder, aspen and white birch are slowly invading back onto the right of way. Normally these right of ways are kept free of trees and shrubs. It is likely this area of the pipeline will be sprayed in the near future. These seeded right of ways are very productive and attractive to livestock. Extreme caution must be taken to prevent over-utilization of these sites because they are sometimes the only openings on a lease that is dominated by forest.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
PAPER BIRCH *(Betula papyrifera)*	4	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	35	-	100
WILLOW *(Salix spp.)*	8	-	100
FORBS			
RED CLOVER *(Trifolium pratense)*	17	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	5	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
FIELD HORSETAIL *(Equisetum arvense)*	3	-	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	-	100
STRAWBERRY *(Fragaria virginiana)*	3	-	100
COMMON YARROW *(Achillea millefolium)*	2	-	100
CANADA GOLDENROD *(Solidago canadensis)*	2	-	100
AMERICAN VETCH *(Vicia americana)*	2	-	100
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	43	-	100
MARSH REED GRASS *(Calamagrostis canadensis)*	20	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 914 M

SLOPE: 5%

ASPECT: NORTH

ECOLOGICAL STATUS SCORE: 0 OR MODIFIED

HEALTH FORM: TAME

FORAGE PRODUCTION(KG/HA):N=1

GRASS	2644
FORBS	342
SHRUBS	480
TOTAL	3466

ECOLOGICALLY SUSTAINABLE STOCKING RATE
0.67 HA/AUM (2-0.4)
0.6 AUM/AC (0.2-1.0)

d4: Hazelnut/Cow parsnip/Kentucky bluegrass

(Corylus cornuta/Heracleum lanatum/Poa pratensis)

n=1 This community type occurs in small isolated openings within the aspen dominated forests near Whitecourt Mountain southwest of Whitecourt. This community is similar to the Hazelnut/Wild sarsaparilla (c3) community previously described, but it occurs on lower slope positions below the wild sarsaparilla type. The high cover of cow parsnip indicates that this community is richer and moister than the Hazelnut/Wild sarsaparilla type. The presence of Kentucky bluegrass also indicates that this community type has been moderately to heavily grazed in the past. Continued heavy grazing pressure will eventually lead to a decline in all native plant species and this community will likely be dominated by Kentucky bluegrass, timothy, clover and dandelion.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	5	-	100
SHRUBS			
HAZELNUT *(Corylus cornuta.)*	10	-	100
ROSE *(Rosa acicularis)*	3	-	100
PIN CHERRY (*Prunus penslyvanica*)	8	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	7	-	100
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	5	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	-	100
SHOWY ASTER *(Aster conspicuus)*	2	-	100
DANDELION *(Taraxacum officinale)*	6	-	100
CLOVER *(Trifolium spp)*	3	-	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	1	-	100
COW PARSNIP *(Heracleum lanatum)*	12	-	100
FIREWEED *(Epilobium angustifolium)*	1	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	19	-	100
HAIRY WILDRYE *(Elymus innovatus)*	4	-	100
PURPLE OATGRASS *(Schizachne purpurascens)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MOD. WELL

ELEVATION: 921 M

SLOPE: 10%

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 8 OR 6

FORAGE PRODUCTION(KG/HA):N=1

GRASS	164
FORBS	1066
SHRUBS	446
TOTAL	1676

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 HA/AUM (10-0.58)
0.2 AUM/AC (0.04-0.70)

d5:Willow/ Kentucky Bluegrass/ Clover

(Salix spp./ Poa pratensis/ Trifolium spp.)

n=9 This community type occurs on the drier edges of wet sedge meadows and Willow - Bog Birch/Sedge or Willow/Marsh reedgrass (c6) dominated community types, where it is easy for livestock to access. The heavy grazing regime has favoured the growth of Kentucky bluegrass, clover and dandelion.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST
TREES			
WHITE SPRUCE			
(*Picea glauca*)	3	0-15	33
SHRUBS			
BOG BIRCH			
(Betula glandulosa)	2	0-18	22
WILLOW			
(Salix spp.)	40	5-90	100
FORBS			
DANDELION			
(Taraxacum officinale)	12	0-30	78
CLOVER			
(Trifolium spp.)	24	0-57	100
VEINY MEADOW RUE			
(Thalictrum venulosum)	7	0-27	89
STAR FLW'D SOLOMON SEAL			
(Smilacina stellata)	6	0-31	56
STRAWBERRY			
(*Fragaria virginiana*)	3	0-9	89
GRASSES			
FOWL MANNA GRASS			
(Glyceria striata)	4	0-27	22
KENTUCKY BLUEGRASS			
(Poa pratensis)	23	0-85	78
CANADA BLUEGRASS			
(Poa compressa)	9	0-60	33
TUFTED HAIR GRASS			
(Deschampsia cespitosa)	2	0-5	44
TIMOTHY			
(Phleum pratense)	4	0-10	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO HYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO POORLY

ELEVATION: 835(1054-1260) M

SLOPE: LEVEL

ECOLOGICAL STATUS SCORE: 8 OR 0

HEALTH FORM: RIPARIAN

FORAGE PRODUCTION(KG/HA):N=4

GRASS	1325(156-4088)
FORBS	787(558-1218)
SHRUBS	53(0-80)
TOTAL	2165 (1138-4646)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (4 - 0.81)
0.1 AUM/AC (0.1-0.5)

DECIDUOUS FOREST COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 9: An Aspen-Balsam Poplar/green alder/marsh reed grass community type found on lower slope seepage areas throughout the Lower Foothills Subregion. This community type produces abundant forage but the density of the tall and low shrub layers (alder) can restrict access and therefore limit grazing potential.

DECIDUOUS FOREST COMMUNITIES

Aspen (*Populus tremuloides* Michx.) and balsam poplar (*Populus balsamifera* L.) make up nearly one-quarter of the 4327 million ovendry tonnes of forest standing crop in the prairie provinces (Bonnor 1985). Deciduous forest communities are also the dominant productive range community types of the Lower Foothills subregion. Six hundred and seventy-six deciduous stands were sampled from 1989 to 1999. These stands fell into three broad groupings, they were the Aspen Community Types, the Aspen-Balsam Poplar - Paper Birch Community Types, and the Aspen Grazed Modified Community Types. This guide separates these three broad groupings.

Aspen is the most widely distributed native tree species in North America (Jones 1985). Alberta alone has over 6.8 million hectares of pure aspen stands which are affected by the multiple use activities of forestry, oil, gas, domestic grazing, wildlife, watershed and recreational use (Wheeler and Willoughby 1993). Over 60% of the 676 deciduous forest stands sampled were grouped into the Aspen Community Types. It would appear the majority of pure aspen stands are found on mesic-medium sites with a productive shrub, forb and grass layer. These community types are generally primary to secondary range on most grazing dispositions within the Lower Foothills.

Balsam poplar and paper birch and are found on moister sites than most Aspen Community Types. Balsam poplar grows best on moist, nutrient-rich, imperfectly-drained, on low-lying ground and paper birch is well adapted to growing on mesic-loamy soils, medium shade tolerance, and is fairly tolerant of nutrient deficits (La Roi 1991). Beckingham (1993) also found that paper birch may prefer to grow on soils with a lower pH (<5.3).

Aspen Grazed Modified Community Types represent Aspen community types that have undergone moderate to heavy historic grazing regimes. Overall, as grazing pressure increases, the canopy cover in the shrub and forb layer declines and there is an increase in low forbs. When grazing pressure becomes severe, native plant species are replaced by non-native invaders (Willoughby 1995).

Figure 6. Key to deciduous stands of the Lower Foothills

1. Aspen dominates the tree canopy cover, Balsam poplar and birch only minor components in the stand.. **2**

Balsam poplar or birch co-dominate the stand, aspen minor component in stand or if dominant represents about 50% of the total canopy cover of trees...................Figure 9 pg 114

2. Ungrazed aspen dominated types, dominated by a diversity of understory layers (tall shrubs, medium shrubs, tall forbs, low forbs and graminoids..Figure 8 pg 93

Grazed aspen dominated types, one or more of the understory layers is missing, low grasses and forbs (Kentucky bluegrass, strawberry, clover and dandelion) dominate the understory ....Figure 11 pg 135

ASPEN COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 10: A typical Aspen/ Rose - Low-bush cranberry/ Tall forb (e7) community type within the Lower Foothills subregion. This community type is sensitive to grazing and occurs on sites that are ungrazed or have a history of light grazing. This community type produces high amounts of palatable forage, and is considered to be the reference plant community for mosic/medium sites in the Lower Foothills Subregion .

Ecology of the Aspen Community Types of the Lower Foothills subregion

Over 60% of the 676 deciduous forest stands sampled in 1990-1999 in the Lower Foothills subregion, were classified into Aspen community types. Within the Lower Foothills aspen ranges from submesic to hygric moisture regimes, with medium to rich nutrient regimes (Beckingham et al 1996). However the modal site conditions are well-drained, mesic-medium dominated by Aw/Rose - Low-bush Cranberry/Tall Forb community type. Prickly rose seems to be a dominant, co-dominant, or subdominant shrub in most aspen stands sampled within this guide. It is believed that prickly rose is an extremely adapted species with a diverse rooting medium that can occupy and array of site and disturbance conditions.

Other shrub and forb species are indicative of specific site conditions along slope gradients (Figure7). The blueberry and bearberry dominated community types are indicative of dry, well drained sites, on sandy and coarse textured soils. The rose-twin-flower (low forb) type appears to be slightly drier with poorer nutrients than the rose-tall forb dominated type, but the dominance of low forbs over tall forbs may also indicate increased grazing pressure. The Aw/buffaloberry type has a similar moisture regime to the Aw/rose types, but appears to be found on sites with poorer nutrient regimes with a lower pH (Beckingham 1993). Aw/hazelnut, Aw/white meadowsweet, and Aw/saskatoon appear on similar mesic topographic positions but are affected by specific site conditions.

Further down slope are community types associated with moderately well drained moist-rich adapted species. The Aw/alder dominated types are found on moister sites, although it can be found on upland sites where there is an impermeable soil layer which entraps soil moisture e.g. Aw/alder/marsh reed grass/hairy wild rye. Aw/bracted honeysuckle are also associated with mid to lower sloped subhygric-rich sites and is often associated with balsam poplar. The oak fern and horsetail types are found on moist, nutrient rich sites and seepage areas. The snowberry type is found on well drained sites overlooking rivers and streams. Thimbleberry is commonly found within the Montane Subregion but has been found on nutrient rich seepage areas along river flats. Aw/willow is found on low-lying subhygric to hygric-rich sites in close association with other indicator shrubs such as honeysuckle, and dogwood.

Table 7. Forage production summary for aspen community types within the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
c hairy wild rye submesic/ medium	**Ecosite phase**	**c2 hairy wild rye Aw**						**2.7 (0.15)**
	c1	Aw/blueberry	339	459	198	996	4.0-1.4 (0.1-0.3)	2.7 (0.15)
	c2	Aw/bearberry/fringed brome	339	263	145	747	4.1-2 (0.1-0.2)	2.7 (0.15)
	Ecosite phase	**c2_grazed Aw**						**5.06 (0.08)**
	g1	Aw/rose/hairy wild rye/clover	58	282	34	374	5.78-4.5 (0.07-0.09)	5.06 (0.08)
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e2 low-bush cranberry Aw**						**2.18 (0.17)**
	e3	Aw/buffalo-berry	222	479	182	883	4.1-1 (0.1-0.3)	2.38 (0.17)
	e4	Aw/saskatoon	178	203	239	620	4.05-1.62 (0.1-0.25)	2.25 (0.18)
	e5	Aw/alder	260	404	198	861	4.5-1.19 (0.09-0.34)	1.93 (0.13)
	e6	Aw/alder/marsh reedgrass-hairy wild rye	264	512	113	889	13.5-1.01 (0.03-0.40)	2.7 (0.15)
	e7	Aw/rose-low-bush cranberry/tall forbs	321	460	177	957	4.05-1.01 (0.1-0.4)	1.93 (0.21)
	e8	Aw/rose-twinflower	247	366	235	848	10.12-1.35 (0.04-0.3)	2.13 (0.19)

Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
		Grass	Forb	Shrub	Total	Range	Recommended
e9	Aw/snowberry	408	580	408	1396	4.05-1.31(0.1-0.31)	2.25 (0.18)
e10	Aw/white meadowsweet	274	584	100	959	4.05-2.02 (0.1-0.2)	2.13 (0.15)
e11	Aw/beaked hazelnut/wild sarsaparilla	346	428	465	1240	10.1-1.35 (0.04-0.3)	2.0 (0.2)
Ecosite phase	**e2_grazed Aw**						**2.56 (0.16)**
g2	Aw/rose/strawberry	356	360	182	898	8-1.93 (0.05-0.21)	2.25 (0.18)
g3	Aw/rose/clover	154	414	152	720	8-2.25 (0.05-0.18)	2.53 (0.16)
g4	Aw/kentucky bluegrass/clover	681	380	117	1178	40-2.53 (0.01-0.16)	2.89 (0.14)
Ecosite phase	**e2_harvest Aw**						**2.30 (0.18)**
l5	Aw/marsh reedgrass/rose/firweed	767	844	543	2154	4.05-1.0 (0.1-0.4)	2.0 (0.20)
l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	n/a	13.5-1.0 (0.03-0.4)	2.89 (0.14)
l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	10-1.35 (0.04-0.3)	2.0 (0.20)
Ecosite phase	**e2_harvest_grazed Aw**						**5.33 (0.08)**

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	n/a	40-2.89 (0.01-0.14)	4.0 (0.10)
	m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	40-4 (0.01-0.10)	8 (0.05)
	m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	40-1.93 (0.01-0.21)	4 (0.10)
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**						**11.84 (0.13)**
	e12	Aw/bracted honeysuckle	270	419	135	824	2.70-1.93 (0.15-0.21)	2.13 (0.19)
	e13	Aw/thimbleberry	71	195	469	735	6.74-1.62 (0.06-0.25)	2.53 (0.16)
	e14	Aw/oak fern	0	218	148	366	40 (0.01)	40 (0.01)
	e15	Aw/willow	174	390	167	731	8.09-1.35 (0.05-0.29)	2.7 (0.16)
	Ecosite phase	**f2_harvest**						**2.13 (0.19)**
	l10	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	n/a	2.7-1.93 (0.15-0.21)	2.13 (0.19)
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**						**2.70 (0.15)**
	e16	Aw/rose/horsetail	406	536	319	1260	4.05-1.35 (0.1-0.3)	2.70 (0.15)

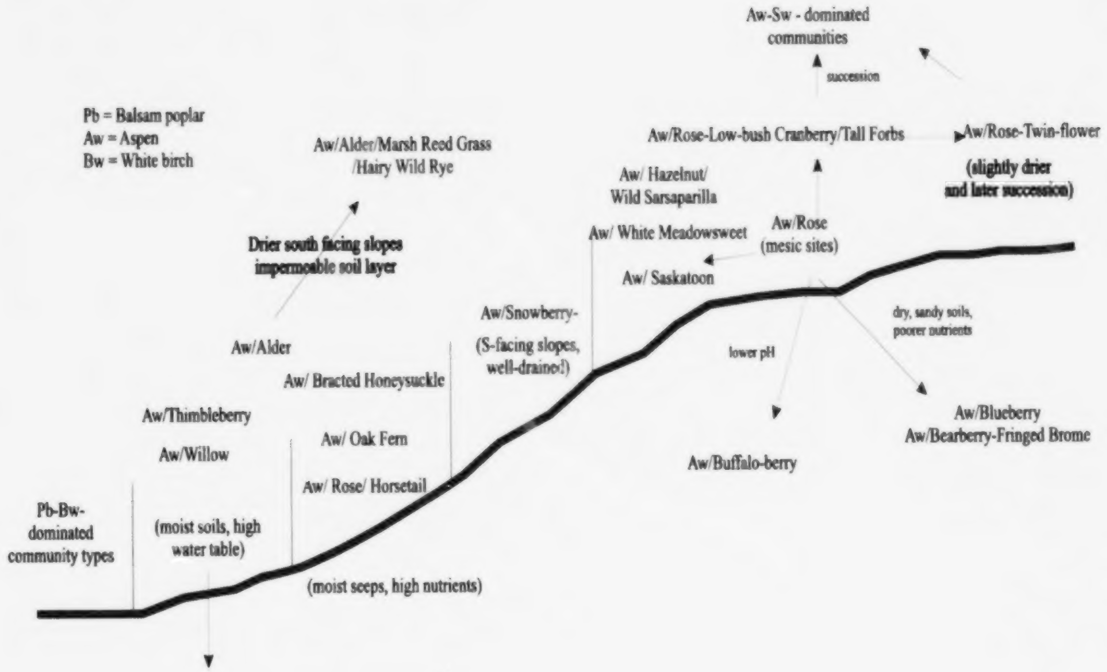

Aw-Sw - dominated communities
succession
Pb = Balsam poplar
Aw = Aspen
Bw = White birch
Aw/Alder/Marsh Reed Grass /Hairy Wild Rye
Aw/Rose-Low-bush Cranberry/Tall Forbs
Aw/Rose-Twin-flower
(slightly drier and later succession)
Aw/ Hazelnut/ Wild Sarsaparilla
Drier south facing slopes impermeable soil layer
Aw/ White Meadowsweet
Aw/Rose (mesic sites)
Aw/ Saskatoon
Aw/Snowberry-
dry, sandy soils, poorer nutrients
Aw/Alder
(S-facing slopes, well-drained)
lower pH
Aw/ Bracted Honeysuckle
Aw/Thimbleberry
Aw/ Oak Fern
Aw/Blueberry
Aw/Bearberry-Fringed Brome
Aw/Willow
Aw/Buffalo-berry
Aw/ Rose/ Horsetail
Pb-Bw-dominated community types
(moist soils, high water table)
(moist seeps, high nutrients)

Figure 7: Landscape profile of Aspen community types of the Lower Foothills Subregion

Figure 8. Ungrazed Aspen community type key

1. Moist nutrient rich sites dominated by Bracted honeysuckle, Thimbleberry, willow, oak fern or horsetail.................................... 2
Submesic or Mesic, medium sites dominated by rose, blueberry, bearberry, low bush cranberry, hazelnut, white meadowsweet, alder, snowberry, buffaloberry or saskatoon.................................... 6

2. Site dominated by thimbleberry, moist nutrient rich areas on slopes of Smoky River and near Whitecourt Mountain ....**Aspen/Thimbleberry** c13
Site dominated by willow, oak fern, horsetail or bracted honeysuckle.................................... 3

3. Lower slope positions dominated by willow or horsetail.................................... 4
Nutrient rich seepage areas dominated by honeysuckle or oak fern.................................... 5

4. Site transitional between willow shrublands and aspen dominated uplands, dominated by willow in the understory.....**Aw/Willow** c15
Site located in lower slope positions adjacent to riparian areas, dominated by horsetail in the understory....................**Aw/Horsetail** c16

5. Nutrient rich seepage area dominated by oak fern and honeysuckle....................................**Aw/Oak fern** c14
Moist nutrient rich area dominated by honeysuckle, oak fern only minor ....**Aw/Honeysuckle** c12

6. Submesic sites dominated by blueberry and/or bearberry.................................... 7
Mesic sites dominated by rose, saskatoon, snowberry, hazelnut, white meadowsweet, alder, buffaloberry, or low bush cranberry.. 8

7. Dry well drained sites dominated by rose and blueberry (bearberry low in cover)....................................**Aw/Blueberry** c1
Slightly moister sites with bearberry dominating the understory (blueberry only found in small amounts).................................... ....**Aw/Bearberry/Fringed brome** c2

8. Alder dominates the understory.................................... 9
Rose, saskatoon, buffaloberry, snowberry, hazelnut, white meadowsweet dominates the understory, alder low in cover represented by scattered individuals.................................... 10

9. Well developed grass and forb layer with open canopy of alder, site is found on southerly slopes at higher elevations ....**Aw/Alder/Marsh reedgrass-Hairy wildrye** c6
High canopy cover of alder, site found on northerly aspects....................................**Aw/Alder** c5

10. South facing aspen dominated slopes adjacent to rivers and streams, sites are dominated by saskatoon and snowberry.................. 11
Upland sites and level areas dominated by hazelnut, buffaloberry, white meadowsweet, rose or low bush cranberry.......................... 12

11. Understory dominated by Snowberry....................................**Aw/Snowberry** c9
Understory dominated by Saskatoon....................................**Aw/Saskatoon** c4

12. South facing slopes with some seepage dominated by hazelnut in understory..............................**Aw/Hazelnut/Wild sarsaparilla** c10
Upland sites dominated by buffaloberry, white meadowsweet , rose or low bush cranberry.................................... 13

13. Upland sites dominated by buffaloberry or white meadowsweet, community types common to the Saddle Hills north of Grande Prairie.................................... 14
Upland sites dominated by rose and low bush cranberry in understory.................................... 15

14. Understory dominated by buffaloberry....................................**Aw/Buffaloberry** c3
Understory dominated by white meadowsweet....................................**Aw/White meadowsweet** c10

15. Ungrazed stands dominated by tall forbs of wild sarsaparilla, fireweed, peavine, showy aster, tall lungwort..**Aw/Rose/Tall forbs** c7
Ungrazed or lightly to moderately grazed sites dominated by low forbs, bunchberry, wintergreen, wild lily-of-the-valley, twinflower, strawberry or heavily grazed sites dominated by Kentucky bluegrass, clover and dandelion.................................... 16

16. Ungrazed sites, dominated by twinflower, bunchberry....................................**Aw/Rose/Twinflower** c8
Grazed sites dominated by strawberry, clover, dandelion, bunchberry, wintergreen, Kentucky bluegrass.................................... 17

17. Lightly to moderately grazed sites dominated by low growing native forbs, strawberry, bunchberry, wintergreen ....**Aw/Rose/Strawberry** g2
Heavily grazed sites dominated by clover, dandelion and Kentucky bluegrass.................................... 18

18. Heavily grazed sites dominated by rose and clover....................................**Aw/Rose/Clover** g3
Very heavily grazed sites dominated by Kentucky bluegrass, clover and dandelion.................. **Aw/Kentucky bluegrass/Clover** g4

e1: Aspen/ Blueberry

(Populus tremuloides/ Vaccinium myrtilloides)

n=15 This community type is similar to Aspen/blueberry/hairy wild rye described by Beckingham et al (1996). This community type is dominated by blueberry and other shrub species (bog cranberry and labrador tea) adapted to drier well-drained sites compared to the modal mesic/medium low-bush cranberry ecosites. This may succeed to a White Spruce dominated sites, however the transition is slow due to the dry site conditions (Beckingham et al 1996).

This community type tends to be open and accessible to livestock. Forage production is moderate (n=6 production clippings.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	55	21-80	100
WHITE SPRUCE *(Picea glauca)*	3	2-15	47
SHRUBS			
ROSE *(Rosa acicularis)*	5	0-12	93
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	12	0-34	80
LABRADOR TEA (*Ledum groenlandicum*)	5	0-19	60
BOG CRANBERRY (*Vaccinium vitis-idaea*)	3	0-25	47
RASPBERRY *(Rubus idaeus)*	3	0-14	47
LOW-BUSH CRANBERRY (*Viburum edule*)	3	0-7	40
BUFFALO-BERRY *(Shepherdia canadensis)*	2	0-3	40
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	1-12	100
BUNCHBERRY *(Cornus canadensis)*	8	0-28	93
WILD LILY OF THE VALLEY *(Maianthemum canadense)*	2	1-7	93
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	1-13	87
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-10	80
PALMATED COLTSFOOT *(Petasites palmatus)*	2	0-8	73
LINDLEY'S ASTER (*Aster ciliolatus*)	2	0-6	73
NORTHERN BEDSTRAW (*Galium boreale*)	1	0-3	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-25	80
HAIRY WILD RYE *(Elymus innovatus)*	5	0-19	73
PURPLE OAT GRASS (*Schizachne purpurascens*)	1	0-3	47

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1005 (824 - 1143)M
SLOPE: 5 - 7 %
ASPECT: SOUTH-EASTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION KG/HA N=6

GRASS	339 (157-546)
FORBS	459 (75-1014)
SHRUBS	198 (0-642)
TOTAL	996 (411-1528)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (4-1.4)
0.15 AUM/ac (0.1-0.3)

e2: Aspen/ Bearberry/ Fringed Brome

(Populus tremuloides/ Arctostaphylos uva-ursi/ Bromus ciliatus)

n=2 This community type is similar to the Aw/Bearberry type described by Beckingham (1993). It is found in conjunction with lodgepole pine on dry, well drained sites. Beckingham found that the combination of lighter textured parent material and rapid drainage due to topographic position resulted in a site type that is drier than the modal aspen type. The presence of labrador tea and blueberry in this communiy type indicate that this type is similar to the blueberry- dominated community types. The high amount of fringed brome in this community type indicates that this site is more nutrient rich than the other blueberry-dominated community types.

This community type is usually easily accessible to livestock, but the dry site conditions and poorer nutrient staus limit the amount of regrowth after grazing.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	41	35-47	100
LODGEPOLE PINE			
(Pinus contorta)	3	0-6	50
WHITE SPRUCE			
(Picea glauca)	3	0-6	50
SHRUBS			
BEARBERRY			
(Arctostaphylos uva-ursi)	18	16-20	100
ROSE			
(Rosa acicularis)	14	5-22	100
LABRADOR TEA			
(Ledum groenlandicum)	5	0-9	50
BLUEBERRY			
(Vaccinium myrtilloides)	4	0-7	50
BUFFALO-BERRY			
(Shepherdia canadensis)	3	0-5	50
FORBS			
STRAWBERRY			
(Fragaria virginiana)	14	7-20	100
BUNCHBERRY			
(Cornus canadensis)	8	0-15	50
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	8	0-15	50
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	7	1-13	100
FIREWEED			
(Epilobium angustifolium)	7	3-10	100
AMERICAN VETCH			
(Vicia americana)	5	3-6	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	4	0-8	50
NORTHERN BEDSTRAW			
(Galium boreale) 3	3	100	
COMMON YARROW			
(Achillea millefolium)	2	2	100
GRASSES			
FRINGED BROME GRASS			
(Bromus ciliatus) 11		3-18	100 MARSH
REED GRASS			
(Calamagrostis canadensis)	3	1-5	100
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	2	0-4	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL
ELEVATION: 973 - 1215 M
SLOPE: 4 - 30%
ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=1

GRASS	339
FORBS	263
SHRUBS	145
TOTAL	747

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (4.1-2)
0.15 AUM/AC (0.1-0.2)

e3: Aspen/ Buffalo-berry

(Populus tremuloides/ Shepherdia canadensis)

n=22 This aspen community type is dominated by an understory of buffalo-berry. Beckingham (1994) described a similar community type (Aw/Buffalo-berry). This type had vegetative affinities with the Aw/Rose-Low Bush Cranberry/Tall Forb type due to the common mesic substrate characteristics, but the buffalo-berry type was slightly drier, acidic (pH 5.3) and nutrient poor.

This community type is not as productive as other mesic/medium Aspen types, because the understory is dominated by buffalo-berry which is not palatable to cattle.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	45	15-80	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-18	44
WHITE SPRUCE *(Picea glauca)*	2	0-12	39
SHRUBS			
BUFFALO-BERRY *(Shepherdia canadensis)*	17	9-34	100
ROSE *(Rosa acicularis)*	13	5-30	100
LOW-BUSH CRANBERRY *(Viburum edule)*	5	0-19	77
SASKATOON *(Amelanchier alnifolia)*	2	0-8	46
WILLOW *(Salix spp.)*	2	0-10	46
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-17	41
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	0-17	96
BUNCHBERRY *(Cornus canadensis)*	13	0-24	91
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	0-21	91
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	6	0-16	86
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-13	86
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-5	86
AMERICAN VETCH *(Vicia americana)*	2	0-6	86
FIREWEED *(Epilobium angustifolium)*	4	0-8	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	0-14	82
HAIRY WILD RYE (Elymus innovatus)	6	0-33	59
FRINGED BROME GRASS *(Bromus ciliatus)*	2	0-20	27

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 677 -1050 M (828 M)

SLOPE: 5 - 7 %

ASPECT: SOUTH-EASTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION KG/HA N=16

GRASS	222 (24-514)
FORBS	479 (172-770)
SHRUBS	182 (86-350)
TOTAL	883 (488-1312)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.38 HA/AUM (4.1-1)
0.17 AUM/ac (0.1-0.3)

e4: Aspen/Saskatoon

(Populus tremuloides/Amelanchier alnifolia)

n=4 This community type is found on well-drained sites with a medium nutrient regime as indicated by the abundance of rose and snowberry. When saskatoon dominates the understory, it usually occurs on south and west-facing slopes (Willoughby et al 2005), although in the Lower Foothills it seems to occur on fluvial terraces or slopes. Saskatoon provides important browse for wild ungulates. Livestock also find saskatoon palatable, and in areas where there is extensive cattle grazing, this species can be heavily browsed.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	55	40-70	100
PAPER BIRCH (*Betula papyrifera*)	7	0-20	50
SHRUBS			
SASKATOON *(Amelanchier alnifolia)*	11	6-16	100
ROSE (*Rosa acicularis*)	5	0-13	75
SNOWBERRY OR BUCKBRUSH *(Symphoricarpos occidentalis)*	3	0-7	50
BUFFALO-BERRY *(Shepherdia canadensis)*	1	0-4	50
FORBS			
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	1-13	100
STRAWBERRY *(Fragaria virginiana)*	5	2-8	100
WILD LILY OF THE VALLEY *(Maianthemum canadense)*	1	1	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	3	3-4	75
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	1-4	75
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	1	1-2	75
BUNCHBERRY *(Cornus canadensis)*	3	0-9	50
LINDLEY'S ASTER (*Aster ciliolatus*)	3	0-9	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	0-9	75
SEDGES *(Carex spp.)*	5	0-10	50
HAIRY WILD RYE (*Elymus innovatus*)	2	0-7	25
MOSSES			
(Moss spp.)	30	0-99	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1085 M
SLOPE: 3-15 %
ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	178 (54-331)
FORBS	203 (50-457)
SHRUBS	239 (171-295)
TOTAL	620 (450-959)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.25 HA/AUM (4.05-1.62)

e5: Aspen/ Alder

(Populus tremuloides/ Alnus crispa)

n=52 This community type is generally found at low to mid slope elevations on sites with northerly aspects. It tends to be dominated by green alder in the tall shrub layer and rose & raspberry in the low shrub layer. Wild sarsaparilla dominates the forb layer. EMA (1993) described a similar community type (Aw(Pb)/Green Alder/Wild Sarsaparilla) throughout the Low Boreal Cordilleran ecoregion. They found this type on well drained Orthic Grey Luvisols and Eutric Brunisols (Balsam poplar occurred as a codominant in the overstory on imperfectly drained, luvisolic Gleysols).

Wild Sarsaparilla is well adapted to undisturbed, moist to shaded forests with medium to rich nutrient regimes (MacKinnon et al 1992). The absence of wild sarsaparilla, even though a similar moisture regime is present, may indicate a difference in soil nutrient levels or an intolerance to light-moderate grazing regimes.

There is only a moderate amount of forage being produced for domestic livestock in this community type because most of the production is coming from green alder and wild sarsaparilla which are not palatable to cattle.

Plant Composition Canopy Cover(%)

	Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	50	05-85	100
Balsam Poplar *(Populus balsamifera)*	3	0-20	44
Shrubs			
Green Alder *(Alnus crispa)*	31	5-75	100
Rose *(Rosa acicularis)*	10	0-31	100
Low Bush Cranberry *(Viburnum edule)*	7	0-30	83
Raspberry *(Rubus idaeus)*	5	0-30	67
White Meadowsweet *(Spiraea betulifolia)*	4	0-19	56
Willow *(Salix spp.)*	6	0-15	50
Bracted Honeysuckle *(Lonicera involucrata)*	4	0-20	48
Forbs			
Bunchberry *(Cornus canadensis)*	8	0-65	94
Fireweed *(Epilobium angustifolium)*	5	0-26	89
Common Pink Wintergreen *(Pyrola asarifolia)*	3	0-10	87
Strawberry *(Fragaria virginiana)*	4	0-20	83
Cream-Colored Vetchling *(Lathyrus ochroleucus)*	3	0-16	81
Wild Lily-of-the-Valley *(Maianthemum canadense)*	2	0-7	75
Wild Sarsaparilla *(Aralia nudicaulis)*	11	0-40	73
Tall Lungwort *(Mertensia paniculata)*	3	0-12	68
Grasses			
Marsh Reed Grass *(Calamagrostis canadensis)*	8	0-30	85
Hairy Wild Rye *(Elymus innovatus)*	5	0-21	50

Environmental Variables

Moisture Regime: Mesic to Subhygric
Nutrient Regime: Mesotrophic to Permesotrophic
Soil Drainage: Moderately Well to Well
Elevation: 974 (597 - 1478)m
Slope: 0 - 15 %
Aspect: North -Easterly

Ecological Status Score: 18

Forage Production in kg/ha: n=27

Grass	260 (24-1032)
Forbs	404 (80-956)
Shrubs	198 (0-712)
Total	861 (396-1571)

Ecologically Sustainable Stocking Rate
1.93 ha/AUM (4.5-1.19)
0.13 AUM/ac (0.09-0.34)

e6: Aspen/ Alder/ Marsh Reed Grass/ Hairy Wild Rye

(Populus tremuloides/ Alnus crispa/Calamagrostis canadensis - Elymus innovatus)

n=3 This community type is very similar to the previous (Aw/Alder) community type, but is found on higher elevation, slightly drier, well-drained, south facing slopes and indicated by the presence of bearberry, and hairy wild rye. The presence of alder maybe due to an impermeable soil layer which creates higher soil moisture for alder shrubs.

The forage production in this community type is very similar to the previous type, however, the lower predmoninance of alder creates an open understory for livestock distribution. The majority of the production is coming from grass and forbs.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN	42	25-60	100
(Populus tremuloides)			
SHRUBS			
GREEN ALDER			
(Alnus crispa)	14	9-17	100
WHITE MEADOWSWEET			
(Spiraea betulifolia)	4	3-4	100
ROSE			
(Rosa acicularis)	2	0-5	67
BEARBERRY			
(Arctostaphylos uva-ursi)	2	0-4	67
FORBS			
FIREWEED			
(Epilobium angustifolium)	8	2-21	100
BUNCHBERRY			
(*Cornus canadensis*)	8	3-17	100
CREAM-COLOURED VETCHLING			
(*Lathyrus ochroleucus*)	5	1-12	100
STRAWBERRY			
(Fragaria virginiana)	2	1-2	100
WILD SARSAPARILLA			
(*Aralia nudicaulis)*	9	0-17	67
SMOOTH ASTER			
(Aster laevis)	3	0-6	67
AMERICAN VETCH			
(Vicia americana)	2	0-5	67
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	26	14-38	100
HAIRY WILD RYE			
(Elymus innovatus)	25	16-33	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1240 - 1310 M

SLOPE: 12 - 35 %

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=3

GRASS	264 (55-484)
FORBS	512 (44-1128)
SHRUBS	113 (12-306)
TOTAL	889 (120-1918)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.7 HA/AUM (13.5-1.0)
0.15 AUM/AC (0.03-0.40)

e7: Aspen/ Rose - Low-bush Cranberry/ Tall Forbs

(Populus tremuloides/ Rosa acicularis- Viburnum edule/ Tall Forbs*)*

n=52 This community type appears to be the modal aspen type on mesic well to moderately well drained, nutrient medium to rich, undisturbed sites. Beckingham et al (1996) described a similar community type (Aw/Low Bush Cranberry). This community type is also similar to the Aw/Rose/Strawberry (g2) community type, but a high cover of tall growing forbs (ie. wild sarsaparilla, fireweed, and vetchling) distinguishes this type from the low forb type. Presently it is unclear why there is a difference in the forb layers between the tall and low forb types. Corns and Annas (1986) felt that wild sarsaparilla grows under moist, nutrient rich conditions; which may help to explain the difference between the two types. Wild sarsaparilla is also sensitive to disturbance and grazing may cause the tall forb layer to become sparse.

Those Aw/Rose-Low-bush Cranberry/Tall forb community type without wild sarsaparilla, but with plenty of fireweed may exist on slightly drier sites with poorer nutrient regimes than those abundant in wild sarsaparilla. Later seral stages will likely succeed to a mixed Aw-Sw/rose/forb type and climax to an Sw/moss dominated community.

This community type has good forage production and the tall forb layer is highly palatable to cattle.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	57	20-95	100
BALSAM POPLAR			
(Populus balsamifera)	3	0-15	40
SHRUBS			
ROSE			
(Rosa acicularis)	15	1-42	100
LOW BUSH CRANBERRY			
(Viburnum edule)	8	0-50	75
RASPBERRY			
(Rubus idaeus)	6	0-28	68
WHITE MEADOWSWEET			
(Spiraea betulifolia)	3	0-12	45
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	2	0-21	44
FORBS			
WILD SARSAPARILLA			
(Aralia nudicaulis)	14	0-60	71
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	6	0-20	99
BUNCHBERRY			
(Cornus canadensis)	7	0-20	92
STRAWBERRY			
(Fragaria virginiana)	4	0-14	90
FIREWEED			
(Epilobium angustifolium)	8	0-25	85
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	0-13	78
TALL LUNGWORT			
(Mertensia paniculata)	4	0-21	74
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-25	60
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	8	0-38	94
HAIRY WILD RYE			
(Elymus innovatus)	4	0-27	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC- SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL TO WELL
ELEVATION: 686 -1300 M
SLOPE: 0 - 15%
ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=34

GRASS	321 (2-1817)
FORBS	460 (86-959)
SHRUBS	177 (0-560)
TOTAL	957 (202-2776)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.93 HA/AUM (4.05-1.01)
0.21 AUM/AC (0.1-0.4)

e8: Aspen/ Rose - Twinflower

(Populus tremuloides/ Rosa acicularis - Linnaea borealis)

n=30 This community type occupies mesic, well drained sites, with medium nutrient regimes. It is similar to the Aw/Rose type described by Beckingham (1996) and the Aw/Rose-Low-bush cranberry/Tall Forbs c.t. described previously, but it appears to be found on slightly drier sites that have poorer nutrient regimes (buffalo-berry). It is felt that this community type may be at a later successional stage (Sw) as the tall forbs are predominated by low forbs such as bunchberry, strawberry, and common pink wintergreen. This will succeed to a mixed Aw-Sw/rose/forb (h9) and eventually to a Sw/moss (j12) community type.

This community type may also be formed after light to moderate grazing an Aw/Rose-Low-bush cranberry/Tall Forbs (c7) community type. Moderate grazing appears to graze out the taller growing forbs and allow the lower growing forbs to proliferate.

Forage production is good in this community type, but the low growing forbs are not as accessible to livestock or productive as the tall growing forbs.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	57	20-80	100
WHITE SPRUCE *(Picea glauca)*	5	0-15	70
BALSAM POPLAR *(Populus balsamifera)*	3	0-20	43
SHRUBS			
ROSE *(Rosa acicularis)*	13	2-26	100
TWIN-FLOWER *(Linnaea borealis)*	9	2-20	100
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-20	87
BUFFALO-BERRY *(Sheperdia canadensis)*	3	0-10	53
RASPBERRY *(Rubus idaeus)*	3	0-9	53
FORBS			
BUNCHBERRY *(Cornus canadensis)*	11	0-25	97
STRAWBERRY *(Fragaria virginiana)*	4	0-10	97
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-8	97
WILD LILY OF THE VALLEY *(Maianthemum canadense)*	3	0-10	93
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	0-37	90
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-11	87
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-8	73
FIREWEED *(Epilobium angustifolium)*	3	0-10	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	6	0-26	87
HAIRY WILD RYE *(Elymus innovatus)*	6	0-18	80

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 625 -1212 M
SLOPE: 0 - 20 %
ASPECT: SOUTH - WESTERLY

ECOLOGICAL STATUS SCORE: 18-12

FORAGE PRODUCTION IN KG/HA N=15

GRASS	247 (4-504)
FORBS	366 (88-867)
SHRUBS	235 (0-1230)
TOTAL	848 (174-1882)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.13 HA/AUM (10.12-1.35)
0.19 AUM/AC (0.04-0.3)

e9: Aspen/ Snowberry

(Populus tremuloides/ Symphoricarpos occidentalis)

n=6 Snowberry is well adapted to well drained sites and has been found to be common on gravelly flood plains and south facing slopes overlooking rivers and streams throughout the Boreal Forest. This community type was found on the south facing banks of the McLeod River. The soils were fine textured fluvial deposits which may account for the high cover of low bush cranberry.

The forage production within this community type is very good and is palatable to livestock, however use is contingent on accessibility based on slope and shrub density - distribution.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	63	45-90	100
BALSAM POPLAR			
(Populus balsamifera)	3	0-10	33
SHRUBS			
SNOWBERRY	26	12-43	100
(Symphoricarpos occidentalis/alba)			
RASPBERRY			
(Rubus idaeus)	6	2-10	100
ROSE			
(Rosa acicularis)	9	0-12	83
LOW BUSH CRANBERRY			
(Viburnum edule)	6	0-27	50
FORBS			
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	4	1-13	100
AMERICAN VETCH			
(Vicia americana)	2	1-6	100
NORTHERN BEDSTRAW			
(Galium boreale)	1	1-3	100
TALL LUNGWORT			
(Mertensia paniculata)	4	0-9	83
WILD LILY OF THE VALLEY			
(Maianthemum canadense)	1	0-4	83
CANADA VIOLET			
(Viola canadensis)	5	0-25	67
STRAWBERRY			
(Fragaria virginiana)	3	0-8	67
BUNCHBERRY			
(Cornus canadensis)	1	0-3	67
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	3	0-6	83
MARSH REED GRASS			
(Calamagrostis canadensis)	3	0-6	67
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	3	0-11	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: WELL
ELEVATION: 969 M (625 - 1204)
SLOPE: 1-10 %
ASPECT: SOUTH-WESTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=2

GRASS	408 (256-560)
FORBS	580 (360-800)
SHRUBS	408 (182-634)
TOTAL	1396 (798-1396)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.25 HA/AUM (4.05-1.31)
0.18 AUM/AC (0.1-0.31)

e10: Aspen/ White Meadowsweet

(Populus tremuloides/ Spiraea betulifolia)

n=15 This community type is found on well-drained northerly aspects throughout the Saddle Hills. White meadowsweet is characteristic of drier site conditions in deciduous and coniferous forests and can also be found on dry, rocky slopes (MacKinnon et al 1992).

The forage production within this community type is good, however use is contingent on accessibility based on slope and shrub density - distribution.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	61	14-85	100
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	17	12-34	100
ROSE			
(Rosa acicularis)	10	4-15	100
LOW BUSH CRANBERRY			
(Viburnum edule)	5	0-8	80
RASPBERRY			
(Rubus idaeus)	5	0-18	80
TWIN-FLOWER			
(Linnaea borealis)	4	0-15	67
BRACTED HONEYSUCKLE			
(*Lonicera involucrata*)	2	0-6	53
FORBS			
BUNCHBERRY			
(*Cornus canadensis*)	12	3-30	100
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	5	1-11	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	8	0-17	87
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	0-8	87
COMMON PINK WINTERGREEN			
(*Pyrola asarifolia*)	3	0-6	87
WILD LILY OF THE VALLEY			
(Maianthemum canadense)	2	0-9	87
FIREWEED			
(Epilobium angustifolium)	6	0-26	80
STRAWBERRY			
(Fragaria virginiana)	4	0-12	80
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	4	0-14	80
HAIRY WILD RYE			
(Elymus innovatus)	4	0-13	53

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 928 M (724 - 1189)

SLOPE: 1-6 %

ASPECT: NORTH-EASTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=6

GRASS	274 (4-418)
FORBS	584 (356-1065)
SHRUBS	100 (4-170)
TOTAL	959 (548-1505)

ECOLOGICALLY SUSTAINABLE STOCKING RATE

2.13 HA/AUM (4.05-2.02)

0.15 AUM/AC (0.1-0.2)

e11: Aspen/ Beaked Hazelnut/ Wild Sarsaparilla

(Populus tremuloides/ Corylus cornuta/ Aralia nudicaulis)

n=9 This community type is rare throughout the Lower Foothills subregion and is very similar to the abundant Aw/Corylus-Rose/ Wild sarsaparilla (Downing and Karpuk 1992) and Aw/beaked hazelnut (Beckingham and Archibald 1996) community types both described in the Dry Mixedwood subregion. This type appears to occupy wetter and slightly better nutrient microsites (northerly) and have a microclimate resembling the Dry Mixedwood subregion. Corns and Annas (1986) felt that wild sarsaparilla grows under moist, nutrient rich conditions; wild sarsaparilla is also sensitive to disturbance and grazing may cause the tall forb layer to become sparse.

The total production of this type is high, but the majority of the production is coming from hazelnut which is largely unpalatable to livestock. The high cover of hazelnut also restricts access to livestock, limiting the forage availability.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	46	20-70	100
BALSAM POPLAR *(Populus tremuloides)*	5	0-20	67
SHRUBS			
BEAKED HAZELNUT *(Corylus cornuta)*	31	2-64	100
ROSE *(Rosa acicularis)*	11	0-19	89
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-7	89
RASPBERRY *(Rubus ideaus)*	4	0-16	78
SNOWBERRY *(Symphoricarpos occidentalis/alba)*	4	0-9	80
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	3	0-11	67
FORBS			
WILD SARSAPARILLA *(Aralia nudicaulis)*	9	1-21	100
WILD LILY-OF-THE-VALLEY *(Maianthenmum canadense)*	2	1-6	100
LINDLEY'S ASTER (*Aster ciliolatus*)	2	1-4	100
STRAWBERRY *(Fragaria virginiana)*	2	1-3	100
BUNCHBERRY *(Cornus canadensis)*	7	0-22	89
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-8	89
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	0-6	89
PALMATED COLTSFOOT (*Petasites palmatus*)	1	0-3	89
BISHOP'S-CAP (*Mitella nuda*)	3	0-7	78
CANADA VIOLET (*Viola canadensis*)	3	0-8	67
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	3	1-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 897 M (686 - 1212 M)

SLOPE: 0 - 10 %

ASPECT: NORTH-WESTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=6

GRASS	346 (0-736)
FORBS	428 (120-878)
SHRUBS	465 (88-1064)
TOTAL	1240 (798-2216)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 HA/AUM (10.1-1.35)
0.2 AUM/AC (0.04-0.3)

e12: Aspen/ Bracted Honeysuckle

(Populus tremuloides/ Lonicera involucrata)

n=6 Bracted honeysuckle is viewed as an indicator of a moderately moist (subhyric) rich nutrient ecosite and tends to be the most productive ecosite for the Lower Foothills Subregion and in the entire province(Beckingham et al 1996). This community type is generally found on northerly mid to low slope positions receiving nutrient rich seepage waters from upslope. White spruce is developing in the understory indicating a succession to a mixed Aw-Sw stand climaxing to a Sw dominated stand. Under harvesting conditions it is believed that this community will revert to a i10 Aw/honeysuckle/horsetail type (i10) with horsetail emerging with more moister readily available.

The total production of this type is high with diverse shrub and forb layers; however the high cover of shrubs can restricts access to livestock.

Plant Composition	Canopy Cover(%)		
	Mean	Range	Const.
Trees			
Aspen			
(Populus tremuloides)	63	30-75	100
Paper Birch			
(*Betula papyrifera*)	4	0-10	50
Balsam Poplar			
(Populus tremuloides)	3	0-10	33
Shrubs			
Bracted Honeysuckle			
(*Lonicera involucrata*)	23	10-50	100
Low bush Cranberry			
(Viburnum edule)	11	5-25	100
Rose			
(Rosa acicularis)	11	2-15	100
White Spruce			
(*Picea glauca*)	10	0-28	85
Paper Birch			
(Betula papyrifera)	4	0-12	85
Raspberry			
(Rubus ideaus)	3	0-13	67
Currant			
(Ribes spp.)	2	0-4	80
Forbs			
Bunchberry			
(Cornus canadensis)	7	1-12	100
Fireweed			
(*Epilobium angustifolium*)	4	1-13	100
Dewberry or Running Raspberry			
(Rubus pubescens)	3	1-9	100
Tall Lungwort			
(Mertensia paniculata)	2	1-5	100
Wild Sarsaparilla			
(Aralia nudicaulis)	10	0-15	83
Bishop's-cap			
(*Mitella nuda*)	2	0-6	83
Twin-flower			
(*Linnaea borealis*)	4	0-10	67
Cream-coloured Vetchling			
(Lathyrus ochroleucus)	3	0-7	67
Lindley's Aster			
(*Aster ciliolatus*)	2	0-5	50
Grasses			
Marsh Reed Grass			
(Calamagrostis canadensis)	7	2-10	100

ENVIRONMENTAL VARIABLES

Moisture Regime: Subhygric

Nutrient Regime: Permesotrophic

Soil Drainage: Moderately Well

Elevation: 940 m (762 - 1230 m)

Slope: 0 - 5 %

Aspect: Northerly

Ecological Status Score: 18

FORAGE PRODUCTION IN KG/HA: N=3

Grass	270 (72-489)
Forbs	419 (250-508)
Shrubs	135 (56-260)
Total	824 (694-984)

Ecologically Sustainable Stocking Rate
2.13 ha/AUM (2.7-1.93)
0.19 AUM/ac (0.15-0.21)

e13: Aspen/ Thimbleberry

(Populus tremuloides/ Rubus parviflorus)

n=6 This community type is generally rare within the Lower Foothills Subregion. It is more commonly found within the Montane Subregion (as indicated by Willoughby et al (2005) and Archibald et al (1996)) on nutrient rich seepage areas. This community type was found along the north-easterly banks of the Smoky River, NE of Grande Prairie.

Total forage production of this type can be quite high because of the favourable moisture and nutrient conditions. However, usable forage production is quite low due to the predominance of thimbleberry which is unpalatable to livestock.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	30	24-40	100
PAPER BIRCH (*Betula papyrifera*)	4	0-7	67
BALSAM POPLAR *(Populus tremuloides)*	3	0-7	67
SHRUBS			
THIMBLEBERRY (*Rubus parviflorus*)	44	18-85	100
ROSE *(Rosa acicularis)*	7	4-9	100
RIVER ALDER (*Alnus tenuifolia*)	5	3-7	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	1-7	100
SASKATOON *(Amelanchier alnifolia)*	4	0-7	67
FORBS			
BUNCHBERRY *(Cornus canadensis)*	6	4-6	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	2-5	100
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	1-2	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	1	1-2	100
WILD-LILY-OF-THE-VALLEY (*Maianthemum canadense*)	1	1-2	67
SHOWY ASTER *(Aster conspicuus)*	1	1-2	67
GRASSES			
WHITE-GRAINED MOUNTAIN RICE GRASS (*Oryzopsis asperifolia*)	6	1-13	100
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-6	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 674 M

SLOPE: 0 - 5 %

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	71 (0-214)
FORBS	195 (74-326)
SHRUBS	469 (204-988)
TOTAL	735 (288-1172)

ECOLOGICALLY SUSTAINABLE STOCKING RATE

2.53 HA/AUM (6.74-1.62)

0.16 AUM/AC (0.06-0.25)

e14: Aspen/ Oak Fern

(Populus tremuloides/ Gymnocarpium dryopteris)

n=2 This community type is similar to the aspen facies of the Sw/Devil's Club/Oak Fern association described by Corns and Annas (1986) and the Aw/ Low-bush Cranberry/ Fern community type described by Beckingham (1994). Both authors felt that this community type receives a supply of nutrient rich seepage water at some time during the growing season.

The high moisture content and nutrient supply allows for good understory production. However, when oak fern increases in the forb layer the potential for livestock grazing declines.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	53	40-65	100
PAPER OR WHITE BIRCH *(Betula papyrifera)*	8	0-15	50
SHRUBS			
RASPBERRY *(Rubus idaeus)*	12	1-22	100
LOW BUSH CRANBERRY *(Viburnum edule)*	9	8-10	100
ROSE *(Rosa acicularis)*	5	4-5	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	1-3	100
SNOWBERRY *(Symphoricarpos occidentalis)*	9	0-18	50
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-9	50
WILLOW *(Salix spp.)*	2	0-3	50
FORBS			
OAK FERN *(Gymnocarpium dryopteris)*	20	17-22	100
BUNCHBERRY *(Cornus canadensis)*	13	6-18	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	11	3-17	100
TALL LUNGWORT *(Mertensia paniculata)*	7	6-7	100
PALMATED COLTSFOOT *(Petasites palmatus)*	5	2-7	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	1-8	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	1-5	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-9	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 875 M

SLOPE: 2%

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=1

GRASS	20
FORBS	218
SHRUBS	148
TOTAL	366

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

e15: Aspen/ Willow

(Populus tremuloides/ Salix spp.)

n=16 This community type is found on lower slope seepage areas with moderately moist, nutrient rich soils. It is often found in association with other moisture-adapted shrub species such as honeysuckle, dogwood, and to a lesser extent alder. This may be found upslope, in transition, from willow shrubland areas and is an important cover and browse for moose.

The forage production suggests it is adequate for livestock grazing, however accessibility will depend on the density of willow and other co-dominant shrub species that can act as a barrier to livestock access.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	38	18-65	100
BALSAM POPLAR *(Populus balsamifera)*	5	0-16	63
SHRUBS			
WILLOW *(Salix spp.)*	17	2-35	100
ROSE *(Rosa acicularis)*	10	3-33	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	4	0-11	81
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-8	69
BUFFALO-BERRY *(Sheperdia canadensis)*	3	0-15	69
RED-OSIER DOGWOOD *(Cornus stolonifera)*	2	0-6	33
FORBS			
STRAWBERRY *(Fragaria virginiana)*	4	0-5	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-5	100
FIREWEED *(Epilobium angustifolium)*	13	0-35	88
BUNCHBERRY *(Cornus canadensis)*	5	0-14	88
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-4	88
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-8	81
TALL LUNGWORT *(Mertensia paniculata)*	3	0-8	81
SHOWY ASTER *(Aster conspicuus)*	3	0-10	63
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	6	0-15	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO HYGRIC

NUTRIENT REGIME: MESIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 800 M

SLOPE: 0-5 %

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=6

GRASS	174 (38-396)
FORBS	390 (78-1164)
SHRUBS	167 (40-350)
TOTAL	731 (234-1308)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.70 HA/AUM (8.09-1.35)
0.16 AUM/AC (0.05-0.29)

e16: Aspen/ Rose/ Horsetail

(Populus tremuloides/ Rosa acicularis/ Equisetum arvense)

n=3 This community type is moister and richer than the modal Aw/Rose/Low Forbs and Aw/Rose/Tall Forbs types. It is similar to Beckingham's (1994) Aw-Pb/Horsetail community type and will likely succeed to the Sw/Horsetail/Step Moss ecosystem association of Corns and Annas (1986).

This community type has a fair forage base for livestock and the cover of palatable plants is high. Also, because of the high moisture and nutrient regimes regrowth potential after grazing is good.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	42	7-65	100
SHRUBS			
ROSE			
(Rosa acicularis)	18	1-40	100
RASPBERRY			
(Rubus idaeus)	8	0-30	63
SASKATOON			
(Amelanchier alnifolia)	4	0-20	50
SNOWBERRY	3	0-11	50
(Symphoricarpos occidentalis)			
WILLOW			
(Salix spp.)	6	0-20	75
ASPEN			
(Populus tremuloides)	5	0-15	75
FORBS			
FIELD HORSETAIL			
(Equisetum arvense)	22	6-55	100
STRAWBERRY			
(Fragaria virginiana)	4	1-12	100
FIREWEED			
(Epilobium angustifolium)	7	0-30	88
PALMATED COLTSFOOT			
(Petasites palmatus)	6	0-25	88
TALL LUNGWORT			
(Mertensia paniculata)	5	0-23	88
LINDLEY'S ASTER			
(Aster ciliolatus)	4	0-7	88
AMERICAN VETCH			
(Vicia americana)	2	0-5	88
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	3	0-8	75
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	23	5-60	100
FRINGED BROME GRASS			
(Bromus ciliatus)	3	0-10	50
SLENDER WHEAT GRASS			
(Agropyron trachycaulum)	2	0-10	38

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECTLY

ELEVATION: 946 M (647 - 1570 M)

SLOPE: 1 - 20%

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA N=6

GRASS	406 (127-640)
FORBS	536 (175-1024)
SHRUBS	319 (0-669)
TOTAL	1260 (751-1690)

ECOLOGICALLY SUSTAINABLE STOCKING RATE

2.70 HA/AUM (4.05-1.35)

0.15 AUM/AC (0.1-0.3)

ASPEN - BALSAM POPLAR - PAPER BIRCH COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 11: An Aspen - Balsam Poplar - White Birch/ Rose/ Marsh Reed Grass community type within the Lower Foothills Subregion. This community occurs on upland seepage areas and provides suitable forage for domestic grazing.

Ecology of Aspen - Balsam Poplar - Paper Birch Community Types of the Lower Foothills subregion

In the Lower Foothills subregion deciduous forest stands on moist-nutrient rich sites are often codominated by aspen, balsam poplar and to some extent paper birch. Balsam poplar grows best on moist, nutrient-rich, imperfectly-drained, on low-lying ground and paper birch is well adapted to growing on mesic-loamy soils, medium shade tolerance, and is fairly tolerant of nutrient deficits (La Roi 1991). Beckingham (1993) also found that paper birch may prefer to grow on soils with a lower pH (<5.3). Pure stands of Alaska variety paper birch are also found on dry sandy ridges with imperfect drainage (Wilkinson 1990). Beckingham (1993), found that white birch may prefer to grow on soils with a lower pH (<5.3).

The community sequence of aspen - balsam poplar - paper birch community types along a landscape profile is outlined in Figure 9. Moist upslope positions Aw-Pb/Marsh Reed Grass is found with late seral aspen stands. This community type is in close association with Aw-Pb/green alder/marsh reed grass which is found on mid to lower slopes with slightly higher moisture-nutrient regimes. The Aw-Pb/River alder community type is found on moist, imperfectly-drained floodplains, stream channels and topographic lower slope positions.

The Aw-Pb-Bw/Rose/Marsh reedgrass community type is also found on upper slopes that have moderately moist soils as apparent from the predominance of Pb and Bw. The Pb-Aw/Beaked hazelnut community type was also found in the Blueridge Upland ecodistrict on south facing, nutrient rich slopes.

Bracted honeysuckle, cow parsnip, devil's-club, green alder, oak fern, are associated with mid to lower slopes, moderately moist, nutrient rich sites created from seepage waters (Beckingham et al 1996).

The Pb/Snowberry and Aw-Pb/Dogwood community types are found on moist, nutrient rich, seepages, drainages or river flats. These community types are relatively rare throughout the subregion and would contribute little to the overall carrying capacity of a grazing disposition.

The Pb/Willow/Horsetail community type is considered to have a hygric-rich moisture-nutrient regime with high water tables and where organic matter tends to accumulate.

Table 8. Forage production summary for Aspen - Balsam Poplar - Paper Birch community types of the Lower Foothills subregion.

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**						8.65 (0.15)
	f1	Aw-Bw-Pb/bracted honeysuckle/oak fern	324	687	200	1211	40-4 (0.01-0.1)	40 (0.01)
	f2	Pb-Aw/beaked hazelnut	1103	263	739	2105	10-1.35 (0.04-0.30)	2.0 (0 .2)
	f3	Aw-Pb/marsh reedgrass	875	674	429	1978	4-1 (0.1-0.4)	1.93 (0.21)
	f4	Aw-Pb-Bw/rose/marsh reedgrass	296	513	268	1078	4-1 (0.1-0.4)	1.93 (0.21)
	f5	Pb/snowberry	78	230	896	1204	8-2 (0.05-0.20)	4.0 (0.10)
	f6	Aw-Pb/alder/marsh reedgrass	475	543	297	1417	10.1-1.0 (0.03-0.4)	2 (0.20)
	f7	Aw-Pb/alder-honeysuckle	321	511	320	1152	2.7-1.93 (0.15-0.21)	2.38 (0.17)
	f8	Aw-Bw/alder-honeysuckle	131	383	385	899	4-2.33 (0.10-0.17)	2.7 (0.15)
	f9	Aw-Pb/river alder	245	545	397	1187	8-1.35 (0.05-0.3)	2.89 (0.14)
	f10	Aw-Pb/dogwood	216	607	485	1212	4-1.35 (0.10-0.30)	2.0 (0.20)
	f11	Aw-Pb/cowparsnip	350	792	277	1418	4-1 (0.10-0.40)	2.0 (0.20)
	f12	Pb-Aw/devil's club	140	548	238	926	40-4 (0.01-0.1)	40 (0.01)

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	Ecosite phase	**i2_harvest**						2.64 (0.133)
	l11	marsh reedgrass/Pb/wild raspberry/fireweed	1853	1044	53	4424	4-1 (2.1-0.4)	1.93 (0.17)
	l12	Pb/green alder/marsh reedgrass	n/a	n/a	n/a	n/a	13.5-0.1 (0.03-0.4)	2 (0.2)
	l13	marsh reedgrass/Bw-Aw/willow	1492	1264	420	3176	8-2 (0.05-0.2)	4 (0.1)
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**						4 (0.1)
	f13	Pb/willow/horsetail	n/a	n/a	n/a	n/a	8-2 (0.25-0.2)	4 (0.1)

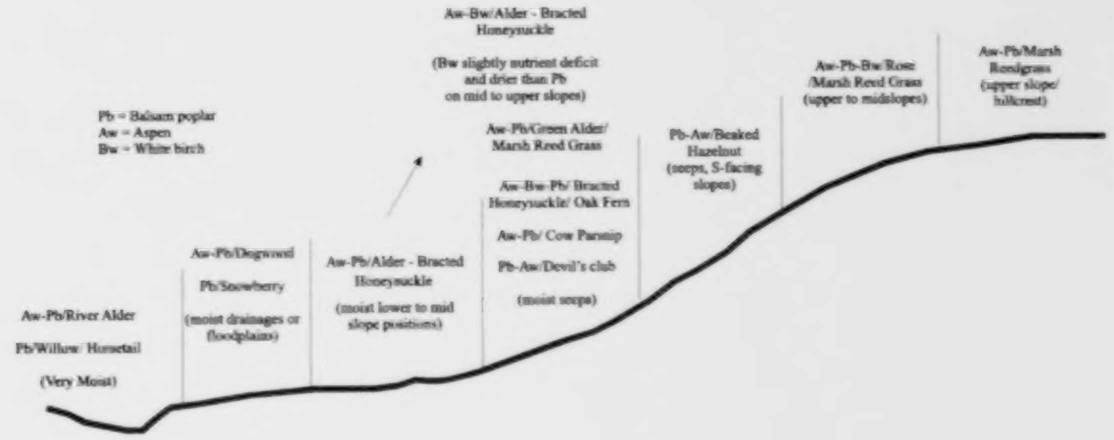

Aw-Bw/Alder - Bracted Honeysuckle
(Bw slightly nutrient deficit and drier than Pb on mid to upper slopes)
Pb = Balsam poplar
Aw = Aspen
Bw = White birch
Aw-Pb/Green Alder/ Marsh Reed Grass
Pb-Aw/Beaked Hazelnut (seeps, S-facing slopes)
Aw-Pb-Bw/Rose /Marsh Reed Grass (upper to midslopes)
Aw-Pb/Marsh Reedgrass (upper slope/ hillcrest)
Aw-Bw-Pb/ Bracted Honeysuckle/ Oak Fern
Aw-Pb/ Cow Parsnip
Pb-Aw/Devil's club
(moist seeps)
Aw-Pb/Dogwood
Pb/Snowberry
(moist drainages or floodplains)
Aw-Pb/Alder - Bracted Honeysuckle
(moist lower to mid slope positions)
Aw-Pb/River Alder
Pb/Willow/ Horsetail
(Very Moist)

Figure 9. Landscape profile of Aspen - Balsam Poplar - Paper Birch community types within the Lower Foothills Subregion.

Figure 10. Aspen-Balsam poplar-Paper birch community type key

1. Lower slope positions adjacent to drainages, or rivers (sites dominated by river alder, red osier dogwood, snowberry, willow, horsetail and devil's club)........ 2
Moist upland seepage areas (dominated by green alder, cow parsnip, honeysuckle, oak fern, beaked hazelnut or marsh reedgrass)........ 6

2. Community associated with river floodplains, with understory dominated by Red osier dogwood or River alder........ 3
Moist seeps and low slopes dominated by Horsetail, willow, devil's club, or Snowberry........ 4

3. Understory dominated by Red osier dogwood........ **Aw-Pb/Dogwood** f10
Understory dominated by River alder........ **Aw-Pb/River alder** f9

4. Moist seeps and drainages dominated by Devil's club........ **Pb-Aw/Devil's club** f12
Moist seeps and drainages dominated by Willow/Horsetail, or Snowberry........ 5

5. Willow/Horsetail dominated low-lying slopes and moist seeps........ **Pb/Willow/Horsetail** f13
Snowberry dominates shrub layer; isolated seepage area on South facing river slopes........ **Pb/Snowberry** f5

6. Closed tree canopy >40% good diversity of understory shrub species (green alder, honeysuckle, rose and hazelnut)........ 7
Over mature deciduous forests; very open, tree cover 15-30%, little shrub cover, understory dominated by marsh reedgrass or cow parsnip........ 11

7. Drier sites, Rose or Hazelnut dominates on upland slopes........ 8
Moister sites, Alder, Honeysuckle, oak fern dominates or co-dominates understory........ 9

8. South facing slopes with Hazelnut dominating........ **Pb-Aw/Beaked Hazelnut** f2
Mesic sites with Rose as dominant shrub........ **Aw-Pb-Bw/Rose/Marsh reed grass** f4

9. Bracted honeysuckle and oak fern dominates understory, low cover of alder........ **Aw-Pb-Bw/Bracted honeysuckle/Oak fern** f1
Alder-Honeysuckle co-dominate understory........ 10

10. Balsam Poplar dominated........ **Aw-Pb/Alder-Honeysuckle** f7
Paper Birch dominated........ **Aw-Bw/Alder-Honeysuckle** f8

11. Cow parsnip dominates the understorey........ **Aw-Pb/Cow parsnip** f11
Marsh reed grass dominates the understorey........ **Aw-Pb/Marsh reed grass** f3

f1: Aspen-Paper Birch-Balsam Poplar/Bracted Honeysuckle/Oak Fern

(Populus tremuloides - Betula papyrifera - Populus balsamifera/ Lonicera involucrata/ Gymnocarpium dryopteris)

n=2 This community type is similar to Aw-Pb/bracted honeysuckle/fern type described by Beckingham et al (1996). It is typified by a closed deciduous tree canopy found on moist-rich upland seepage areas. These moist, shady understories are predominanted by ferns and often horsetails which do not provide palatable forage for domestic livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	28	25-30	100
PAPER BIRCH			
(Betula papyrifera)	20	0-40	50
BALSAM POPLAR			
(Populus balsamifera)	18	0-35	50
SHRUBS			
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	13	10-16	100
LOW-BUSH CRANBERRY			
(Viburnum edule)	7	3-10	100
RASPBERRY			
(Rubus idaeus)	2	1-2	100
GREEN ALDER			
(Alnus crispa)	6	0-12	50
CURRANT			
(Ribes spp.)	5	4-5	50
FORBS			
OAK FERN			
(Gymnocarpium dryopteris)	25	8-43	100
FIREWEED			
(Epilobium angustifolium)	15	1-30	100
BISHOP'S CAP			
(Mitella nuda)	5	1-10	100
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	5	1-8	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	4	1-8	100
LADY FERN			
(Athyrium filix-femina)	3	3-4	100
WOOD HORSETAIL			
(Equisetum sylvaticum)	1	1-2	100
BUNCHBERRY			
(Cornus canadensis)	9	0-17	50
WILD SARSAPARILLA			
(Aralia nudicaulis)	8	0-15	50
GRASSES			
MARSH REED GRASS	11	6-15	100
(Calamagrostis canadensis)			

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 1109 M

SLOPE: 3-15%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=2

GRASS	324 (298-350)
FORBS	687 (450-924)
SHRUBS	200 (0-400)
TOTAL	1211 (1200-1222)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE RANGE
40 ha/AUM (40-4.05)
0.01 AUM/ac (0.01-0.10)

f2: Balsam Poplar - Aspen/ Beaked Hazelnut

(Populus balsamifera - Populus tremuloides/ Corylus cornuta)

n=4 This community type is similar to Aw/beaked hazelnut (e11)described previously, however this type occurs on lower-sloped moist nutrient rich, seepage areas. Tree cover is dominated by balsam poplar and aspen and the shrub layer is dominated by hazelnut and rose. The high shrub cover limits the growth of grasses and forbs and restricts movement by cattle. This community type is very productive, but the majority of the production comes from hazelnut which is generally unpalatable to livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR			
(Populus balsamifera)	30	20-55	100
ASPEN			
(Populus tremuloides)	20	5-30	100
PAPER BIRCH			
(Betula papyrifera)	3	0-7	50
SHRUBS			
BEAKED HAZELNUT			
(Corylus cornuta)	30	10-67	100
ROSE			
(Rosa acicularis)	18	1-36	100
RASPBERRY			
(Rubus idaeus)	7	2-15	100
SNOWBERRY	6	1-17	100
(Symphoricarpos occidentalis)			
SASKATOON			
(Amelanchier alnifolia)	3	0-5	75
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	2	0-4	75
FORBS			
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	5	1-9	100
AMERICAN VETCH			
(Vicia americana)	2	1-6	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	2	1-4	100
TALL LUNGWORT			
(Mertensia paniculata)	2	1-7	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	4	0-8	75
FIREWEED			
(Epilobium angustifolium)	4	0-8	75
BUNCHBERRY			
(Cornus canadensis)	6	0-13	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	13	1-39	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 856 M (891 - 1106 M)

SLOPE: 15 - 30 %

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	1103 (10-2898)
FORBS	263 (4-660)
SHRUBS	739 (480-1002)
TOTAL	2105 (616-3904)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 HA/AUM (10-1.35)
0.2 AUM/ac (0.04-0.30)

f3: Aspen-Balsam Poplar/Marsh Reed Grass

(Populus tremuloides - Populus balsamifera/ Calamagrostis canadensis)

n=13 This community type is typical of drier hilltops throughout the Blueridge Upland ecodistrict. It is typified by an open tree canopy dominated by aspen. Unlike the midslope (Aw/Alder/Marsh reedgrass (e5)) the alder cover is low ranging from 0-25%. The open tree and tall shrub layers allow for good growth of marsh reedgrass. On light to moderately grazed sites marsh reedgrass dominates the understory vegetation. Increased grazing pressure causes a decline in grass cover and favours the growth of low growing forbs (strawberry, bunchberry, wintergreen).

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	15	5-40	100
BALSAM POPLAR *(Populus balsamifera)*	4	0-30	76
SHRUBS			
ROSE *(Rosa acicularis)*	10	2-18	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	5	0-9	92
RASPBERRY *(Rubus idaeus)*	4	0-7	85
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	6	0-17	77
GREEN ALDER *(Alnus crispa)*	5	0-12	68
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	1-12	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	6	1-11	100
BUNCHBERRY *(Cornus canadensis)*	5	0-19	92
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-7	92
COMMON PINK WINTERGREEN (*Pyrola asarifolia*)	2	0-9	92
STRAWBERRY *(Fragaria virginiana)*	9	0-32	85
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	0-7	85
LINDLEY'S ASTER (*Aster ciliolatus*)	4	0-9	85
TALL LUNGWORT (*Mertensia paniculata*)	2	0-4	85
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-15	69
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	38	11-63	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 848 - 984 M

SLOPE: 5 - 7%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=8

GRASS	875 (424-1486)
FORBS	674 (272-1412)
SHRUBS	429 (8-1440)
TOTAL	1978 (716-3122)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.93 HA/AUM (4-1)
0.21 AUM/AC (01.0-0.40)

f4: Aspen-Balsam Poplar-Paper Birch/Rose/Marsh Reed Grass

(Populus tremuloides-Populus balsamifera -Betula papyrifera / Rosa acicularis/ Calamagrostis canadensis)

n=60 This community type is characterized by the dominance of Balsam poplar in the upper canopy with aspen as a sporadic codominant or subdominant. It is very similar to the Aw-Pb/Rose-Wild raspberry vegetation described by EMA (1993), only this type is found on wetter, more nutrient rich sites. There is a gradient from this type to the drier Aw-Pb/Rose-Wild raspberry EMA type and then further upslope on drier soils the Aw/Rose/Cranberry/Tall forb type (e7). The high moisture and nutrient supply allow for good production of low growing shrubs, tall forbs and grass. The relatively open canopy cover also allows for easy access to domestic livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	24	0-65	90
BALSAM POPLAR *(Populus balsamifera)*	20	0-65	85
PAPER BIRCH *(Betula papyrifera)*	13	0-70	35
SHRUBS			
ROSE *(Rosa acicularis)*	14	0-45	97
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	0-20	87
RASPBERRY *(Rubus idaeus)*	7	0-40	77
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-41	67
SNOWBERRY *(Symphoricarpos occidentale)*	3	0-15	67
Forbs			
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	4	0-10	93
STRAWBERRY *(Fragaria virginiana)*	6	0-12	92
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-7	92
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-10	88
BUNCHBERRY *(Cornus canadensis)*	7	0-15	87
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-12	77
FIREWEED *(Epilobium angustifolium)*	3	0-12	75
WILD SARSAPARILLA *(Aralia nudicaulis)*	7	0-34	67
Grasses			
MARSH REED GRASS *(Calamagrostis canadensis)*	14	0-50	95
HAIRY WILD RYE *(Elymus innovatus)*	2	0-10	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 894 M (671 - 1250 M)

SLOPE: 0 - 34%

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=30

GRASS	296 (32-1040)
FORBS	513 (100-1630)
SHRUBS	268 (4-784)
TOTAL	1078 (452-2679)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.93 HA/AUM (4-1)
0.21 AUM/AC (0.10-0.40)

f5: Balsam Poplar/ Snowberry

(Populus balsamifera/ Symphoricarpos occidentale)

n=1 This vegetation type was found in a small seepage area on a slope overlooking the North Saskatchewan river. Snowberry prefers well drained habitats and has been found to be quite common on forested slopes and river flood plains throughout the Boreal forest. The presence of balsam poplar indicates that the moisture content is sufficient to allow for its growth.

This community type is usually found on small isolated sites. Consequently, it would contribute little to the overall carrying capacity of a lease.

PLANT COMPOSITION CANOPY COVER(%)

	RANGE	RANGE	CONST.
TREES			
BALSAM POPLAR			
(Populus balsamifera)	80	-	100
SHRUBS			
SNOWBERRY	29	-	100
(Symphoricarpos occidentale)			
RASPBERRY			
(Rubus idaeus)	6	-	100
ROSE			
(Rosa acicularis)	3	-	100
FORBS			
BANEBERRY			
(Actaea rubra)	8	-	100
CANADA VIOLET			
(Viola canadensis)	8	-	100
RICHARSON'S GERANIUM			
(Geranium richarsonii)	6	-	100
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	6	-	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	7	-	100
BLUNT SEDGE			
(Carex obtustata)	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL TO MODERATELY WELL

ELEVATION: 1060 M

SLOPE: 3%

ASPECT: SOUTH

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA:N=1

GRASS	78
FORBS	230
SHRUBS	896
TOTAL	1204

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (8-2)
0.10 AUM/AC (0.05-0.20)

f6: Aspen - Balsam Poplar/ Alder/Marsh Reed Grass

(Populus tremuloides - Populus balsamifera/ Alnus crispa/ Calamagrostis canadensis)

n=55 This community type occupies mid to lower-slope positions and is easily recognized in the field by the presense of alder. Green alder *(Alnus crispa)* would be more abundant than river alder *(Alnus tenuifolia)* on midslope positions, and the opposite would be true on the lower slope positions. However, tree, forb and grass layers are very similar at both mid and lower-slope positions. The thickness of the alder is what determines this community type's suitability for domestic livestock. Where alder cover is extremely high (50-75%), the grazing potential of this community type would be reduced due to limited access and lack of forage from the shading effect of alder. Where the alder cover is a little lower, marsh reedgrass will provide a good forage base and the grazing potential of this community type is likely quite good.

This community type is similar to the Pb-Aw/Alder type described by Beckingham (1993) and the Aw (Pb)/ Green alder/ Wild Sarsaparilla and Pb-Aw/ Bracted Honeysuckle- River alder community types described by Environmental Management Associates (EMA) (1993). This community type is found on mesic to hygric, moderately well-drained sites. The moisture regime is slightly wetter than the Pb-Aw/Rose (f4) community type, which likely accounts for the increased growth of alder.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	20	0-60	96
BALSAM POPLAR *(Populus balsamifera)*	17	0-60	95
SHRUBS			
GREEN ALDER *(Alnus crispa)*	36	5-85	100
ROSE *(Rosa acicularis)*	11	0-32	95
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	0-10	86
RASPBERRY *(Rubus idaeus)*	8	0-33	86
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-13	58
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	0-10	93
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-12	91
BUNCHBERRY *(Cornus canadensis)*	5	0-13	89
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	0-12	89
TALL LUNGWORT *(Mertensia paniculata)*	3	0-12	89
WILD SARSAPARILLA *(Aralia nudicaulis)*	7	0-46	80
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-12	78
STRAWBERRY *(Fragaria virginiana)*	4	0-7	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	23	2-60	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 903 M (582 - 1460 M)
SLOPE: 0 - 30 %
ASPECT: NORTHERLY
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=38

GRASS	475 (18-1444)
FORBS	543 (37-1372)
SHRUBS	297 (2-866)
TOTAL	1417 (229-2690)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 ha/AUM (10.1-1.0)
0.2 AUM/ac (0.03-0.4)

f7: Aspen - Balsam Poplar/ Alder - Bracted Honeysuckle

(Populus tremuloides - Betula papyrifera/ Alnus crispa - Lonicera involucrata)

n=30 This community type is a transition between two community types described by Beckingham et al (1996), i.e. Aw-Pb/bracted honeysuckle/fern and Aw-Pb/green alder-river alder/fern. These community types are presistant on mid to low slopes and receive nutrient-rich seepage waters.

Forage production on this type is only moderate. A large component of the total production is coming from alder, an unpalatable shrub to livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	21	5-38	100
BALSAM POPLAR			
(Populus balsamifera)	16	0-55	90
SHRUBS			
GREEN ALDER			
(Alnus crispa)	29	0-54	80
RIVER ALDER			
(Alnus tenuifolia)	10	0-40	37
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	19	0-39	97
ROSE			
(Rosa acicularis)	11	0-25	97
LOW-BUSH CRANBERRY			
(Viburnum edule)	6	0-20	93
RASPBERRY			
(Rubus idaeus)	7	0-30	90
CURRANT			
(*Ribes spp.*)	3	0-30	85
FORBS			
FIREWEED			
(Epilobium angustifolium)	7	2-20	100
BUNCHBERRY			
(Cornus canadensis)	5	0-16	97
SWEET-SCENTED BEDSTRAW			
(Galium triflorum)	2	0-7	97
DEWBERRY			
(Rubus pubescens)	6	0-18	93
NORTHERN BEDSTRAW			
(Galium boreale)	2	0-4	77
LINDLEY'S ASTER			
(Aster ciliolatus)	5	0-11	93
WILD SARSAPARILLA			
(Aralia nudicaulis)	4	0-15	73
COW PARSNIP			
(Heracleum lanatum)	3	0-16	47
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	21	0-63	97

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 877 M (746 - 1049 M)

SLOPE: 0 - 20%

ASPECT: NORTH-EASTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA:N=24

GRASS	321 (28-998)
FORBS	511 (30-2606)
SHRUBS	320 (2-928)
TOTAL	1152 (615-3120)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.38 ha/AUM (2.7-1.93)
0.17 AUM/ac (0.15-0.21)

f8: Aspen - White Birch/ Alder - Bracted Honeysuckle

(Populus tremuloides - Betula papyrifera/ Alnus crispa - Lonicera involucrata)

n=3 This community type is dominated by aspen in the overstory and birch in the secondary canopy. It is very similar to the Aw-Pb-Bw/Rose/Marsh reedgrass (f4)community type, but the high cover of alder distinquishes this community type from the other. This type has a similar moisture and nutrient regime to the Aw-Bw/Rose community type, but this type has poorer drainage which may account for the high cover of alder.

Forage production on this type is only moderate. A large component of the total production is coming from alder, an unpalatable shrub to livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	39	25-60	100
PAPER BIRCH *(Betula papyrifera)*	17	6-30	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	40	30-55	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	22	5-40	100
PAPER BIRCH *(Betula papyrifera)*	8	2-8	100
CURRANT *(Ribes spp.)*	4	3-4	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	3	0-5	67
RED-OSIER DOGWOOD *(Cornus stolonifera)*	3	0-6	67
FORBS			
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	20	4-50	100
BUNCHBERRY *(Cornus canadensis)*	11	10-12	100
STRAWBERRY *(Fragaria virginiana)*	8	5-10	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	8	0-15	67
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	3-5	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	25	5-40	100
FRINGED BROME *(Bromus ciliatus)*	3	2-5	100
MOSS			
FEATHERMOSS *(Pleurozium schreberi)*	3	3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 883 M (866 - 915 M)

SLOPE: 5-7 %

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA:N=2

GRASS	131 (62-200)
FORBS	383 (299-467)
SHRUBS	385 (354-416)
TOTAL	899 (776-1021)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.70 HA/AUM (4-2.38)
0.15 AUM/AC (0.10-0.17)

f9: Aspen - Balsam Poplar/ River Alder

(Populus tremuloides - Populus balsamifera/ Alnus tenuifolia)

n=6 This community type is found on lower slopes along natural drainages or areas with high water tables. River alder persists on moist sites and is replaced by green alder on slightly drier upper slope positions. This community type is similar to Aw-Pb/green alder-river alder/fern described by Beckingham et al (1996).

Forage production on this type is high, however a large component is from unpalatable alder shrubs that act as a barrier to livestock access.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR			
(Populus balsamifera)	12	1-30	100
ASPEN			
(Populus tremuloides)	10	4-20	100
PAPER BIRCH			
(Betula papyrifera)	2	0-5	67
SHRUBS			
RIVER ALDER			
(Alnus tenuifolia)	38	15-80	100
ROSE			
(Rosa acicularis)	12	1-25	100
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	5	1-11	100
RASPBERRY			
(Rubus idaeus)	9	0-20	83
LOW-BUSH CRANBERRY			
(Viburnum edule)	6	0-12	83
RED-OSIER DOGWOOD			
(Cornus stolonifera)	4	0-13	67
CURRANT			
(Ribes spp.)	3	0-8	67
FORBS			
LINDLEY'S ASTER			
(Aster ciliolatus)	4	1-10	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	1-6	100
PALMATED COLTSFOOT			
(Petasites palmatus)	2	1-3	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	5	0-15	83
COMMON HORSETAIL			
(Equisetum arvense)	3	0-5	83
TALL LUNGWORT			
(Mertensia paniculata)	2	0-6	83
SWEET-SCENTED BEDSTRAW			
(Galium triflorum)	2	0-4	83
CANADA VIOLET			
(Viola canadensis)	2	0-6	67
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	5	2-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECTLY

ELEVATION: 763 M (364 - 1135 M)

SLOPE: 0 - 25%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	245 (91-372)
FORBS	544 (238-1078)
SHRUBS	397 (0-712)
TOTAL	1187 (888-1350)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.89 HA/AUM (8-1.35)
0.14 AUM/AC (0.05-0.3)

f10: Aspen - Balsam Poplar/ Red-Osier Dogwood

(Populus tremuloides - Populus balsamifera/ Cornus stolonifera)

n=13 This community type is very similar to the Aw-Pb/dogwood/fern c.t. described by Beckingham et al (1996). It is found along stream banks and natural drainages that receive nutrient rich seepage waters. The diversity of tall and low shrubs accounts for the high nutrient status and production. However, it also reduces the accessibility of these sites for domestic grazing. It provides excellent wildlife habitat and food values.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	24	20-55	100
BALSAM POPLAR *(Populus balsamifera)*	9	0-20	77
SHRUBS			
ROSE *(Rosa acicularis)*	12	3-28	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	10	5-29	100
RASPBERRY *(Rubus idaeus)*	6	0-10	85
WILLOW *(Salix spp.)*	6	0-9	85
LOW-BUSH CRANBERRY *(Viburnum edule)*	5	0-16	85
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	4	0-13	62
FORBS			
BUNCHBERRY *(Cornus canadensis)*	6	0-20	92
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	3	0-7	92
FIREWEED *(Epilobium angustifolium)*	5	0-12	85
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-7	77
TALL LUNGWORT *(Mertensia paniculata)*	3	0-9	77
SHOWY ASTER *(Aster conspicuus)*	3	0-7	62
WILD SARSAPARILLA *(Aralia nudicaulis)*	8	0-35	54
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	9	1-30	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECTLY

ELEVATION: 728 M (364 - 1135 M)

SLOPE: 0 - 25%

ASPECT: NORTHERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	216 (68-400)
FORBS	607 (238-1088)
SHRUBS	485 (0-1266)
TOTAL	1212 (259-2422)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 HA/AUM (4-1.35)
0.20 AUM/AC (0.10-0.30)

f11: Aspen - Balsam Poplar/ Cow parsnip

(Populus tremuloides - Populus balsamifera/ Heracleum lanatum)

n=8 This community type was found on lower sloped positions within Whitecourt Mountain and Solomon Creek Valley. Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip.

Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and maybe extensively utilized. These sites have low shrub layer which makes the understory accessible for livestock.

PLANT COMPOSITION	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	46	30-60	100
BALSAM POPLAR (*Populus balsamifera*)	6	0-25	75
PAPER BIRCH *(Betula papyrifera)*	5	0-15	50
SHRUBS			
ROSE *(Rosa acicularis)*	5	1-11	100
RASPBERRY *(Rubus idaeus)*	4	0-21	88
BRACTED HONEYSUCKLE (*Lonicera involucrata)*	2	0-6	75
SNOWBERRY *(Symphoricarpos occidentalis)*	2	0-4	62
FORBS			
COW PARSNIP *(Heracleum lanatum)*	11	2-19	100
CANADA VIOLET *(Viola canadensis)*	6	1-20	100
CREAM-COLOURED VETCHLING *(Lathyrus ochroelucus)*	2	0-4	100
LINDLEY'S ASTER (*Aster ciliolatus)*	6	0-15	88
TALL LUNGWORT (*Mertensia paniculata*)	3	0-13	88
DEWBERRY *(Rubus pubescens)*	3	0-6	88
VEINY MEADOW RUE *(Thalictrum venulosum)*	3	0-9	88
COMMON HORSETAIL *(Equistem arvense)*	3	0-6	63
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	7	0-21	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME (MEAN): SUBHYGRIC

NUTRIENT REGIME (MEAN): PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECT

ELEVATION: 915 M (786-988 M)

ASPECT: EASTERLY

SLOPE: 7 (6-9)%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=8

GRASS	350 (28-858)
FORB	792 (356-1122)
SHRUB	277 (50-1014)
TOTAL	1418 (940-1978)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 HA/AUM (4-1)
0.2 AUM/AC (0.10-0.40)

f12: Balsam Poplar - Aspen/ Devil's - Club

(Populus balsamifera - Populus tremuloides/ Oplopanax horridum)

n=1 This community type was found along natural drainages and nutrient rich-slopes along lower slope positions adjacent to Whitecourt Mountain. The terrain and vegetation associated with this community type usually creates poor accessibility for domestic grazing. Also the majority of the shrub and forbe layer is unpalatable (devil's club, hazelnut, oak fern, wild sarsaparilla) to livestock.

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
Trees			
Balsam Poplar			
(Populus balsamifera)	40	-	100
Aspen			
(Populus tremuloides)	20	-	100
Paper Birch			
(Betula papyrifera)	10	-	100
Shrubs			
Devil's Club			
(Oplopanax horridum)	14	-	100
Bracted Honeysuckle			
(Lonicera involucrata)	5	-	100
Low-bush Cranberry			
(Viburum edule)	2	-	100
Beaked Hazelnut			
(Corylus cornuta)	2	-	100
Forbs			
Oak Fern			
(Gymnocarpium dryopteris)	7	-	100
Wild Sarsaparilla			
(Aralia nudicaulis)	7	-	100
Cow parsnip			
(Heracleum lanatum)	7	-	100
Fairybells			
(Disporum trachycarpum)	6	-	100
Common Horsetail			
(Equisetum arvense)	5	-	100
Grasses			
Marsh Reed Grass			
(Calamagrostis canadensis)	3	-	100

Environmental Variables

Moisture regime : Subhygric

Nutrient regime : Permesotrophic

Soil drainage: Moderately Well

Elevation: 850 m

Slope: 25%

Aspect: North-easterly

Ecological status score: 18

Forage Production in kg/ha: N=1

Grass	140
Forb	548
Shrub	238
Total	926

Ecologically sustainable stocking rate
Generally non-use
40 ha/AUM (40-4)
0.01 AUM/ac (0.01-0.1)

f13: Balsam Poplar/ Willow/ Horsetail

(Populus balsamifera/ Salix spp./ Equisetum arvense)

n=3 This community type is similar Pb-Aw/horsetail c.t. described by Beckingham et al (1996) found on moist-rich Gleysolic soils. These sites are characterized by high water tables and will likely succeed to white spruce.

The high shrub density can restrict livestock access, however horses have been noticed to selectively graze different species of horsetail during the summer and winter months.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	45	43-50	100
ASPEN *(Populus tremuloides)*	6	0-10	67
SHRUBS			
WILLOW *(Salix spp.)*	20	2-26	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	8	1-12	100
LOW-BUSH CRANBERRY *(Viburum edule)*	6	0-18	67
BRACTED HONEYSUCKLE (*Lonicera involucrata)*	6	0-14	67
SNOWBERRY *(Symphoricarpos albus)*	5	0-13	67
FORBS			
MEADOW HORSETAIL *(Equisetum pratense)*	14	6-20	100
WOODLAND HORSETAIL *(Equisetum sylvaticum)*	4	0-8	67
COMMON HORSETAIL *(Equisetum arvense)*	4	0-6	67
TALL LUNGWORT (*Mertensia paniculata*)	4	1-6	100
DEWBERRY (*Rubus pubescens)*	3	1-5	100
FIREWEED *(Epilobium angustifolium)*	2	1-2	100
BISHOP'S CAP *(Mitella nuda)*	2	1-2	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	5	2-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME : SUBHYGRIC

NUTRIENT REGIME : PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECT TO POORLY

ELEVATION: 726 M

SLOPE: 1-3%

ASPECT: NORTH-EASTERLY

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION IN KG/HA: N=0

TOTAL	1260* (ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 ha/AUM (8-2)
0.1 AUM/ac (0.05-0.2)

GRAZED MODIFIED ASPEN COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 12: This Aspen/ Rose/ Clover stand represents a heavily-grazed aspen forest. All of the tall forbs and most of the shrubs have disappeared. The forb layer is now dominated by grazing-resistant species such as, clover, strawberry, common pink wintergreen, and bunchberry.

Ecology of the Aspen grazed modified community types of the Lower Foothills Subregion

The Aspen/Rose-Low-bush Cranberry/Tall Forb plant community type are primary forage areas on modal, mesic/medium sites within the Lower Foothills. With moderate to heavy grazing regimes the canopy cover in the shrub and forb layer declines and there is an increase in low forbs; strawberry (*Fragaria virginiana*), bunchberry (*Cornus canadensis*), common pink wintergreen (*Pyrola asarifolia*), and clover (*Trifolium spp.*) (Willoughby 1995). This disturbance regime has created two unique community types based on grazing succession. With prolonged moderate grazing regimes Aw/Rose/Strawberry is identified and under heavier grazing regimes Aw/Rose/Clover is the predominate community type, and on slightly drier sites Aw/Rose/Hairy Wild Rye/Clover predominates. With moderate to heavy grazing native shrub and forb richness, diversity, and forage production declines (898, 720, 480 kg/ha respectively), and as a result suggested grazing levels are reduced compared to the modal undisturbed community type (Aw/Rose-Low-bush Cranberry/Tall Forb at 957 kg/ha), However, It is presently unclear whether this community type can revert back to its modal undisturbed condition by restricting grazing. Monitoring an Aw/Rose/Clover, restricted from grazing, over the past 10 years has not changed its species composition.

When grazing pressure becomes severe, native plant species decline in cover and are replaced by kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*) and clover (*Trifolium spp.*) to form the Aw/Kentucky Bluegrass/Clover community type. However, it is believed that kentucky bluegrass also an indicator of a slightly higher moisture/nutrient regime and as a result has a higher forage production (1178 kg/ha). To compensate for the loss of native species diversity it is recommended that grazing levels reflect a more conservative estimate; thereby the ecosite phase e2_low-bush cranberry Aw forage production summary is used (Table 10).

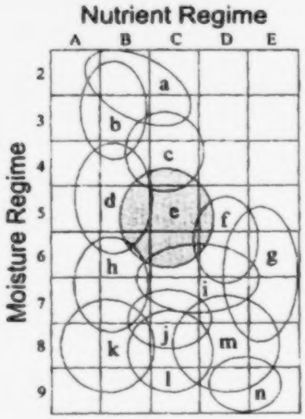
Table 9. Forage production summary for aspen grazed modified community types of the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
c hairy wild rye submesic/ medium	**Ecosite phase**	**c2 hairy wild rye Aw**						**2.7 (0.15)**
	c1	Aw/blueberry	339	459	198	996	4-1.4 (0.1-0.3)	2.7 (0.15)
	c2	Aw/bearberry/fringed brome	339	263	145	747	4.1-2 (0.1-0.2)	2.7 (0.15)
	Ecosite phase	**c2_grazed Aw**						**5.06(0.08)**
	g1	Aw/rose/hairy wild rye/clover	58	282	34	374	5.78-4.5 (0.07-0.09)	5.06(0.08)
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e2 low-bush cranberry Aw**						**2.38 (0.17)**
	e3	Aw/buffalo-berry	222	479	182	883	4.1-1 (0.1-0.3)	2.38 (0.17)
	e4	Aw/saskatoon	178	203	239	620	4.05-1.62 (0.1-0.25)	2.25 (0.18)
	e5	Aw/alder	260	404	198	861	4.5-1.19 (0.09-0.34)	3.11 (0.13)
	e6	Aw/alder/marsh reedgrass-hairy wild rye	264	512	113	889	13.5-1.01 (0.03-0.40)	2.7 (0.15)
	e7	Aw/rose-low-bush cranberry/tall forbs	321	460	177	957	4.05-1.01 (0.1-0.4)	1.93 (0.21)
	e8	Aw/rose-twinflower	247	366	235	848	10.12-1.35 (0.04-0.3)	2.13 (0.19)
	e9	Aw/snowberry	408	580	408	1396	4.05-1.31 (0.1-0.31)	2.25 (0.18)

Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
		Grass	Forb	Shrub	Total	Range	Recommended
e10	Aw/white meadowsweet	294	627	101	1022	4.05-2.02 (0.1-0.2)	2.70(0.15)
e11	Aw/beaked hazelnut/wild sarsaparilla	346	428	465	1240	10.1-1.35 (0.04-0.3)	2 (0.2)
Ecosite phase	**e2_grazed Aw**						**2.56 (0.16)**
g2	Aw/rose/strawberry	396	360	182	938	8-1.93 (0.05-0.21)	2.25 (0.18)
g3	Aw/rose/clover	154	414	152	720	8-2.25 (0.05-0.13)	2.53 (0.16)
g4	Aw/kentucky bluegrass/clover	661	380	117	1178	40-2.53 (0.01-0.16)	2.89 (0.14)
Ecosite phase	**e2_harvest Aw**						**2.30 (0.18)**
l5	Aw/marsh reedgrass/rose/fireweed	767	844	543	2154	4.05-1.0 (0.1-0.4)	2.0 (0.20)
l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	n/a	13.5-1.0 (0.03-0.4)	2.89 (0.14)
l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	10-1.35 (0.04-0.3)	2.0 (0.2)
Ecosite phase	**e2_harvest_grazed Aw**						**5.33 (.08)**
m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	n/a	40-2.89 (0.01-0.14)	4 (0.10)
m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	40-4 (0.01-0.10)	8 (0.05)
m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	40-1.93 (0.01-0.21)	4 (0.10)

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**						**11.84 (0.13)**
	e12	Aw/bracted honeysuckle	191	379	175	1097	2.70-1.93 (0.15-0.21)	2.13 (0.19)
	e13	Aw/thimbleberry	71	195	469	735	6.74-1.62 (0.06-0.25)	2.53 (0.16)
	e14	Aw/oak fern	0	218	148	366	40 (0.01)	40 (0.01)
	e15	Aw/willow	174	390	167	731	8.09-1.35 (0.05-0.29)	2.7 (0.16)
	Ecosite phase	**f2_harvest**						**2.13 (0.19)**
	l10	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	n/a	2.7-1.93 (0.15-0.21)	2.13 (0.19)
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**						**2.70 (0.15)**
	e16	Aw/rose/horsetail	406	536	319	1260	4.05-1.35 (0.1-0.3)	2.70 (0.15)

Ecosite Phase
e2 low-bush cranberry_grazed Aw n=115



CHARACTERISTIC SPECIES

Tree [60] aspen
[4] balsam poplar*
[1] white birch*
[1] white spruce*

Shrub [15] prickly rose
[4] wild red raspberry*
[2] low-bush cranberry*
[1] bracted honeysuckle*
[1] green alder*
[1] saskatoon*
[1] Canada buffalo-berry*
[1] snowberry*

Forb [10] clover spp.
[6] wild strawberry
[6] bunchberry
[4] dandelion
[4] cream-colored vetchling
[4] Lindley's aster
[2] northern bedstraw
[3] common pink wintergreen
[3] dewberry
[2] palmate-leaved coltsfoot
[2] wild lily-of-the valley

[1] northern bedstraw
Grass [6] marsh reedgrass
[6] kentucky bluegrass
[4] hairy wildrye

SITE CHARACTERTISTICS
Moisture Regime: subhyric^{4}, mesic^{2}
Nutrient Regime: rich^{4}, medium^{2}
Topographic Position: lower slope^{3}, mid slope^{1}, upper slope^{2}
Slope: (2-5)^{4}, (10-15)^{2}
Aspect: northerly^{3}, westerly^{3}

SOIL CHARACTERISTICS**
Organic Thickness: (6-15)^{6}, (0-5)^{4}
Humus Form: mor^{6}, raw moder^{3}
Surface Texture: SiL^{2}, SL^{2}, L^{1}, Si^{1}
Effective Texture: C^{3},CL^{2}, SCL^{1}, SiC^{1}, SiCL^{1}
Depth to Mottles/Gley: none^{7}, (0-25)^{2}
Drainage: well^{5}, mod.well^{4}, imperfect^{1}
Parent Material: M^{5}, GF^{1}
Soil Subgroup: O.GL^{3}, BR.GL^{3}, GL.GL^{1}, E.EB^{1}
Soil type: SM4^{8}, SD4^{1}

PLANT COMMUNITY TYPES (N)
g2 Aw/rose/strawberry (65)
g3 Aw/rose/clover (21)
g4 Aw/kentucky bluegrass/clover (29)

FORAGE PRODUCTION (KG/HA) n=75
Grass 412 (12-1817)
Forb 370 (0-1228)
Shrub 162 (0-920)
Total 944 (210-2776)

SUGGESTED GRAZING HA/AUM
2.0

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20. ** Soil Characteristics are from f2 bracted honeysuckle Aw-Pb Ecosite Phase summary.

Figure 11. Grazed Modified Aspen community type key

1. Heavily to moderately grazed sites, with clover, dandelion and Kentucky bluegrass dominating the understory.. 2
Lightly to moderately grazed sites, majority of understory vegetation is composed of native grasses, forbs and shrubs.. 4

2. Dominated by K. bluegrass and clover..........................**Aw/Kentucky bluegrass/Clover** g4
Moderately to heavily grazed with some native shrubs and forbs still present.......................... 3

3. Site dominated by strawberry, the majority of forbs are low growing. Rose is the dominant shrub..........................**Aw/Rose/Strawberry** g2
Site is dominated by clover, only low growing forbs dominate the site. Rose is the dominant shrub..........................**Aw/Rose/Clover** g3

4. Drier sites with poor nutrient status: sites dominated by Clover and Hairy wildrye........
..........................**Aw/Rose/Hairy wildrye/Clover** g1
Lightly grazed sites, dominated by low growing forbs (strawberry, bunchberry, wintergreen, wild lily-of-the-valley, dewberry)..........................**Aw/Rose/Strawberry** g2

g1: Aspen/ Rose/ Hairy Wild Rye/ Clover

(Populus tremuloides/ Rosa acicularis/ Elymus innovatus/ Trifolium repens or hybridum)

n=2 This community type represents an over-utilized aspen/rose (e7) community type as indicated by the predominance of clover. However, this community type seems to be at the drier end of a mesic/medium, with the predominance of hairy wild rye and the low forage production. This type is located on high elevation sites west of Sundre on the fringe between the Lower and Upper Foothills Subregions. Willoughby (2005) described a Aw/rose/hairy wild rye community type on dry south facing slopes throughout the Upper Foothills, this is a grazed modified variant of this Upper Foothills community type.

Under drier site conditions heavy grazing seems to lower forage production with the replacement of native forbs and grass with clover. This community type has a low forage production and requires a period of rest from grazing in order to replace native forbs and increase forage production.

PLANT COMPOSITION	**CANOPY COVER(%)**		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	60	55-65	100
WHITE SPRUCE			
(Picea glauca)	8	0-15	50
SHRUBS			
ROSE			
(Rosa acicularis)	9	3-14	100
TWIN-FLOWER			
(Linnaea borealis)	6	3-8	100
BUFFALO-BERRY			
(Shepherdia canadensis)	4	0-8	50
FORBS			
CLOVER			
(Trifolium repens)	13	9-16	100
STRAWBEBRRY			
(Fragaria virginiana)	6	4-7	100
BUNCHBERRY			
(Cornus canadensis)	5	1-9	100
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	1	1	100
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	24	22-25	100
PURPLE OAT GRASS			
(Schizachne purpurascens)	7	0-14	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1290 M

SLOPE: 2-5 %

ASPECT: EASTERLY

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION IN KG/HA N=2

GRASS	58 (30-86)
FORBS	282 (240-324)
SHRUBS	34 (10-58)
TOTAL	374 (328-420)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
5 HA/AUM (5.78-4.5)
0.08 AUM/AC (0.07-0.09)

g2: Aspen/ Rose/ Strawberry

(Populus tremuloides/ Rosa acicularis/ Fragaria virginiana)

n=65 This community type represents an Aspen/Rose - Low-bush cranberry/ Tall Forb (e7) which has been moderately grazed. As a result, the tall native forb and shrub layer has been reduced in richness and diversity while low-growing forbs such as Strawberry, Common Pink Wintergreen, and Bunchberry has increased.

This community type has not been grazed as heavily as communities predominated by clover as native forbs and grass still predominate. However, the forage production is reduced due to the reduction in tall native forbs that are found in the undisturbed community (e7 Aw/Rose-Low-bush Cranberry/Tall Forbs). In order to maintain native species diversity and richness, and potentially improve range health, the stocking rate is reduced.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	56	25-90	100
BALSAM POPLAR			
(Populus balsamifera)	4	0-20	50
SHRUBS			
ROSE			
(Rosa acicularis)	17	5-42	100
RASPBERRY			
(Rubus idaeus)	5	0-30	66
LOW-BUSH CRANBERRY			
(Viburum edule)	2	0-12	63
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	1	0-3	55
FORBS			
STRAWBERRY			
(Fragaria virginiana)	6	1-32	100
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	4	0-17	99
BUNCHBERRY			
(Cornus canadensis)	7	0-18	92
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	4	0-19	92
NORTHERN BEDSTRAW			
(Galium boreale)	2	0-4	92
DEWBERRY			
(Rubus pubescens)	4	0-14	80
TALL LUNGWORT			
(Mertensia paniculata)	3	0-15	77
DANDELION			
(Taraxacum officinale)	1	0-6	62
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	8	0-40	92
HAIRY WILD RYE			
(Elymus innovatus)	4	0-33	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 932 M (572 -1219 M)

SLOPE: 5 % (1-30%)

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 12

FORAGE PRODUCTION IN KG/HA N=44

GRASS	356 (12-1652)
FORBS	360 (50-1066)
SHRUBS	182 (0-920)
TOTAL	898 (220-2522)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.25 HA/AUM (8-1.93)
0.18 AUM/AC (0.05-0.21)

g3: Aspen/ Rose/ Clover

(Populus tremuloides/ Rosa acicularis/ Trifolium repens)

n=21 This community type represents an Aspen/ Rose-Low-bush Cranberry/ Tall Forb (e7) which has been heavily grazed. The richness and diversity of the native shrubs and forbs has been reduced and replaced with clover and dandelion invading the site. The predominance of clover indicates heavy grazing pressure and, is believed, to indicate a slightly drier moisture regime compared to the sites dominated by kentucky bluegrass. As a result of grazing and site conditions forage production has considerably declined from the reference Aspen/ Rose-Low-bush Cranberry/ Tall Forb community type and thereby stocking rate is also lowered.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	56	20-90	100
BALSAM POPLAR			
(Populus balsamifera)	5	0-20	48
WHITE SPRUCE			
(Picea glauca)	2	0-10	48
SHRUBS			
ROSE			
(Rosa acicularis)	11	3-36	100
SNOWBERRY OR BUCKBRUSH			
(Symphoricapos occidentalis)	2	0-8	67
BUFFALO-BERRY			
(Shepherdia canadensis)	2	0-11	52
RASPBERRY			
(Rubus idaeus)	2	0-12	38
FORBS			
CLOVER			
(Trifolium spp.)	19	3-35	100
STRAWBERRY			
(Fragaria virginiana)	3	0-7	92
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	3	0-12	90
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	2	0-9	90
BUNCHBERRY			
(Cornus canadensis)	4	0-13	86
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-17	86
COMMON DANDELION			
(Taraxacum officinale)	2	0-6	86
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	3	0-23	76
KENTUCKY BLUEGRASS			
(Poa pratensis)	3	0-19	52
PURPLE OAT GRASS			
(Schizachne purpurascens)	2	0-18	48

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 915 M (824-1151 M)

SLOPE: 5-9%

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 6

FORAGE PRODUCTION IN KG/HA: N=13

GRASS	154 (32-596)
FORBS	414 (126-1228)
SHRUBS	152 (30-480)
TOTAL	720 (210-1674)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.53 ha/AUM (8-2.25)
0.16 AUM/ac (0.05-0.18)

g4: Aspen/ Kentucky Bluegrass/ Clover

(Populus tremuloides/ Poa pratensis/ Trifolium repens)

n=29 This community type is representative of an Aspen/ Rose - Low-bush Cranberry/ Tall Forb (e7) which has received prolonged heavy grazing. This community type often occurs in relatively small isolated patches created by intensive grazing adjacent to water, salt, or tempory holding areas. The species richness and diversity of native shrubs, forbs, and grass is reduced and replaced by grazing resistant clover, dandelion, and kentucky bluegrass.

The change in species composition reduced forage production for the two previous community type, i.e. Aw/Rose/Strawberry (g2) and Aw/Rose/Clover(g3), however this community type has noticeabily greater forage production even when compared to the undisturbed modal c.t. (Aw/Rose - Low-bush Cranberry/ Tall Forbs at 957 kg/ha). It is believed that kentucky bluegrass will increase with prolonged heavy grazing regimes on sites with relatively higher moisture/nutrient regimes, and thereby the higher forage production. It is recommended that a more conservative stocking rate be utilized to restore native plant species, diversity and richness and range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	55	0-90	100
SHRUBS			
ROSE *(Rosa acicularis)*	6	0-44	76
RASPBERRY *(Rubus idaeus)*	3	0-23	41
FORBS			
CLOVER *(Trifolium spp.)*	22	2-84	100
COMMON DANDELION *(Taraxacum officinale)*	10	0-37	90
STRAWBERRY *(Fragaria virginiana)*	7	0-24	90
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	3	0-22	72
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-16	62
BUNCHBERRY *(Cornus canadensis)*	3	0-13	55
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	22	0-88	93
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-24	66
HAIRY WILD RYE *(Elymus innovatus)*	4	0-32	66
PURPLE OAT GRASS *(Schizachne purpurascens)*	6	0-25	62

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1090 M (818 - 1280 M)

SLOPE: 3-7 %

ASPECT: SOUTHERLY

ECOLOGICAL STATUS SCORE: 0 OR MODIFIED

FORAGE PRODUCTION IN KG/HA: N=18

GRASS	681 (76-1817)
FORBS	380 (0-959)
SHRUBS	117 (0-753)
TOTAL	1178 (291-2776)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.89 HA/AUM (40-2.53)
0.14 AUM/AC (0.01-0.16)

MIXEDWOOD FOREST COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 13: A typical mixedwood community type within the Lower Foothills subregion. These stands develop as an aspen forest begins to succeed towards a conifer-dominated climax community type. As this stand succeeds toward climax and spruce becomes dominant, the canopy becomes closed and understory production decreases.

MIXEDWOOD FORESTS

The mixedwood forest community types within the Lower Foothills subregion occur as either a mixture of white spruce or lodgepole pine and deciduous (usually aspen) trees. The sites where the different mixedwood community types occur are determined by moisture and soil nutrient regime. The white spruce-deciduous community types usually occur on finer textured soils that have good soil drainage, while the lodgepole pine-deciduous community types usually occur on coarser textured soils with poorer nutrients.

The white spruce-deciduous community type that occurs most often (the reference plant community) throughout the Lower Foothills subregion on ungrazed sites is the Aspen-White Spruce/Rose/Forb (h9) community type described as Aw-Sw-Pl/prickly rose or Aw-Sw-Pl/low-bush cranberry by Beckingham et al (1996). Heavy grazing this community type can cause a decline in tall forbs, i.e. fireweed, wild sarsaparilla, cream-colored vetchling creating a new community type dominanted by low-growing forbs Aspen/Rose/Clover (g3). Sites that are drier (either because of rapid drainage or exposure) than the reference white spruce-deciduous type support Aspen-White spruce/Buffalo-berry-Bearberry, Aw-Sw/Buffalo-berry or Pb-Sw/Chokecherry-Bearberry (upland seepage) community types. While sites that are wetter than the modal community type support Aspen-Balsam Poplar-White spruce/Alder, and Aspen-White Spruce-Balsam Poplar/Bracted honeysuckle community types. As white spruce begins to dominate the overstory and exert more shading influences on the understory vegetation a later seral White Spruce-Aspen/Low Forb community type will predominate and continue to develop to a climax White Spruce (Balsam Fir)/Feathermoss community type on most of the sites described above. Figure 12 illustrates the relationships that these community types have to one another.

The lodgepole pine-deciduous community types seem to occur along a gradient of soil moisture and nutrient regime. The Lodgepole Pine-White Spruce-Aspen/Labrador tea/Feathermoss community type seems to occur under the poorest soil nutrient conditions (mesic/poor). The higher cover of Labrador tea may indicate slightly more acidic soils (Beckingham et al 1996). Under slightly drier soil moisture and higher soil nutrient conditions Logdepole Pine-Aspen/Buffalo-berry and Lodgepole Pine-White Spruce-Aspen/Rose/Hairy Wild Rye are apparent on the lower scale of a mesic(or submesic)/medium grid. The Lodgepole Pine-Aspen/Forb/Marsh Reedgrass community type occupies sites on typical mesic moisture and medium nutrient regimes. These better growth conditions result in a better developed understory and higher forage productivity. The Logdepole pine-Aspen/Alder dominated community type are also found on mesic/medium sites. However, the presence of alder may indicate higher elevation sites in the upland ecodistricts or an impermeable soil layer that permits higher soil moisture availability. Upland seepage areas may also consist of Aspen-Lodgepole Pine-White Spruce/Snowberry community types. Figure 13 illustrates the relationships that these community types have with one another.

Table 10. Forage production summary of mixedwood forest community types within the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
b bearberry/ lichen submesic/ poor	**Ecosite phase**	**b1 bearberry Aw-Sw-Pl**						**8 (0.05)**
	h1	Pb-Sw/chokecherry-bearberry	60	334	318	712	40-4 (0.01-0.10)	8 (0.05)
c hairy wild rye submesic/ medium	**Ecosite phase**	**c3 hairy wild rye Aw-Sw-Pl**						**4 (0.10)**
	h2	Aw-Sw/buffalo-berry/bearberry	258	180	120	558	6.7-2.13 (0.06-0.19)	4 (0.10)
	Ecosite phase	**c3_harvest**						**8 (0.05)**
	12	Aw/hairy wild rye/dwarf bilberry-labrador tea	1786	111	232	2129	40-4 (0.01-0.10)	8 (0.05)
d labrador tea - mesic mesic/poor	**Ecosite phase**	**d3 labrador tea - mesic Aw-Sw-Pl**						**8 (0.05)**
	h3	Pl-Sw-Aw/labrador tea/feathermoss	220	225	193	637	40-2.7 (0.01-0.15)	8 (0.05)

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e3 low-bush cranberry Aw-Sw-Pl**						**3.3 (0.13)**
	h4	Aw-Sw/buffalo-berry	115	402	223	739	4-1.35 (0.10-0.3)	3.37 (0.12)
	h5	Aw-Pl/buffalo-berry	61	311	196	568	4.5-2.5 (0.09-0.16)	4.0 (0.10)
	h6	Aw-Pl/alder	58	334	428	820	40-2 (0.01-0.2)	4 (0.10)
	h7	Aw-Pb-Sw/alder	171	253	189	613	40-2 (0.01-0.2)	4 (0.10)
	h8	Pl-Aw/forb/marsh reedgrass	200	500	100	800	4-2 (0.10-0.2)	2.89 (0.14)
	h9	Aw-Sw/rose/forb	237	360	183	781	8-2 (0.05-0.2)	2.25 (0.18)
	h10	Pl-Sw-Aw/rose/hairy wild rye	319	288	210	816	8-2 (0.05-0.2)	2.50 (0.16)
	h11	Aw-Pl-Sw/snowberry	144	216	531	891	8-2.25 (0.05-0.18)	3.37 (0.12)
	Ecosite phase	**e3_grazed**						**4 (0.10)**
	i1	Aw-Sw/clover	161	220	115	496	40-2.7 (0.01-0.15)	4 (0.10)
	Ecosite phase	**e3_harvest**						**2.38 (0.17)**
	i8	Aw/willow/purple oatgrass/dwarf bilberry	240	116	1400	1756	8-2 (0.05-0.20)	2.38 (0.17)

	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**e3_harvest_grazed**						**8 (0.05)**
	m5	clover/timothy/buffalo-berry/Pl-Sw	3090	658	322	4070	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**f3 bracted honeysuckle Aw-Sw-Pl**						**8 (0.05)**
	h12	Aw-Sw-Pb/bracted honeysuckle	n/a	n/a	n/a	900*	40-2.5 (0.01-0.16)	8 (0.05)
	Ecosite phase	**f3_harvest Aw-Sw-Pl**						**8 (0.05)**
	l14	fireweed/green alder/Pl-Sw	325	1210	1075	2610	40-4 (0.01-0.10)	8 (0.05)

* estimated production.

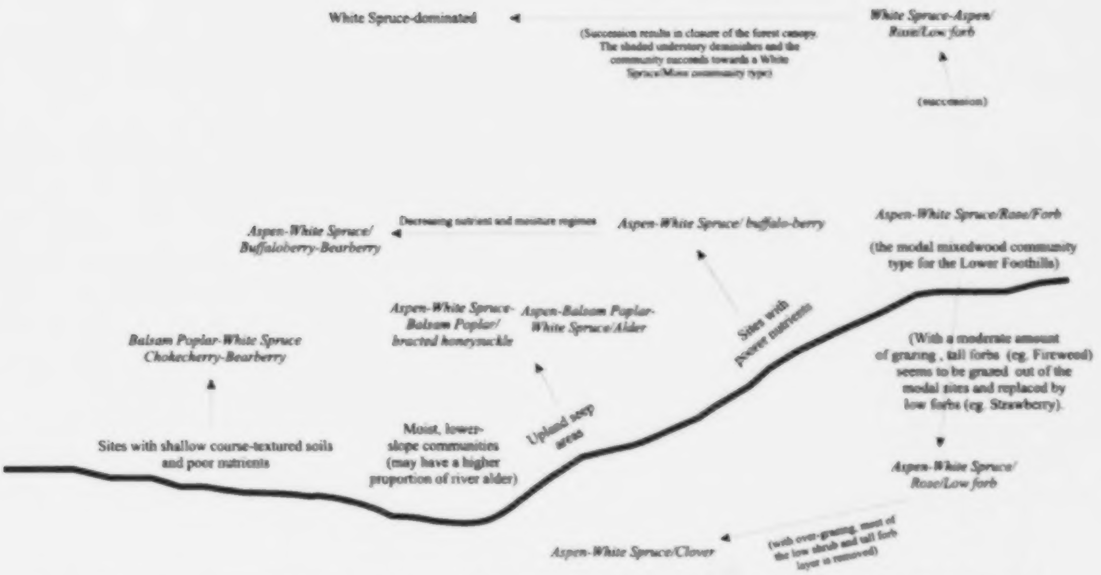

White Spruce-dominated
(Succession results in closure of the forest canopy. The shaded understory diminishes and the community succeeds towards a White Spruce/Moss community type)
White Spruce-Aspen/ Rose/Low forb
(succession)
Aspen-White Spruce/ Buffaloberry-Bearberry
Decreasing nutrient and moisture regimes
Aspen-White Spruce/ buffalo-berry
Aspen-White Spruce/Rose/Forb
(the modal mixedwood community type for the Lower Foothills)
Aspen-White Spruce-Balsam Poplar/ bracted honeysuckle
Aspen-Balsam Poplar-White Spruce/Alder
Sites with poorer nutrients
Balsam Poplar-White Spruce Chokecherry-Bearberry
(With a moderate amount of grazing, tall forbs (eg. Fireweed) seems to be grazed out of the modal sites and replaced by low forbs (eg. Strawberry).
Upland seep areas
Sites with shallow course-textured soils and poor nutrients
Moist, lower-slope communities (may have a higher proportion of river alder)
Aspen-White Spruce/ Rose/Low forb
Aspen-White Spruce/Clover
(with over-grazing, most of the low shrub and tall forb layer is removed)

Figure 12: Landscape profile of spruce-dominated mixedwood community types of the Lower Foothills Subregion

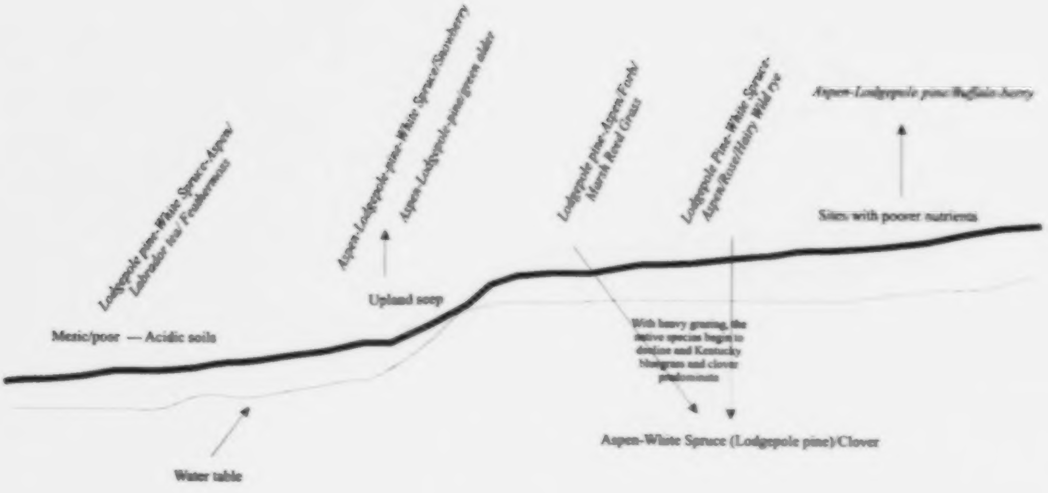

Lodgepole pine-White Spruce-Aspen/
Labrador tea/ Feathermoss
Aspen-Lodgepole pine-White Spruce/Strawberry
Aspen-Lodgepole pine/green alder
Upland seep
Mesic/poor — Acidic soils
Water table
Lodgepole pine-Aspen/Forb/
Marsh Reed Grass
Lodgepole Pine-White Spruce-
Aspen/Rose/Hairy Wild rye
Aspen-Lodgepole pine/Buffalo-berry
Sites with poorer nutrients
With heavy grazing, the native species begin to decline and Kentucky bluegrass and clover predominate
Aspen-White Spruce (Lodgepole pine)/Clover

Figure 13: Landscape profile of pine-dominated mixedwood community types of the Lower Foothills Subregion

Figure 14. Mixedwood Community type key

0. Heavily grazed mixedwood with clover as the dominant understory species
....**Aspen-Sw/Clover** i1
Ungrazed mixedwood communities dominated by a mixture of Aw, Pb, Sw and Pl.. **1**

1. Aspen or Balsam poplar co-dominant with white spruce.. **2**
Aspen co-dominant with lodgepole pine... **9**

2. Well drained, submesic sites, understory dominated by Bearberry................................ **3**
Mesic sites Bearberry not present in community structure.. **4**

3. Buffaloberry is a major shrub species......................**Aw-Sw/Buffaloberry-Bearberry** h2
Chokecherry is a major shrub species........................**Pb-Sw/Chokecherry/Bearberry** h1

4. Buffalo berry dominates the community..................................**Aw-Sw/Buffaloberry** h4
Buffalo berry does not dominate the community understory.. **5**

5. Moist nutrient rich sites, with Bracted Honeysuckle dominating the understory...........
....**Aw-Sw-Pb/Bracted Honeysuckle** h12
Mesic sites dominated by rose, alder.. **6**

6. Rose dominates the community.. **7**
Alder is co-dominant in this community..**Aw-Pb-Sw/Alder** h7

7. Rose predominant with well developed grass and forb layer.. 8
Grass and forb layers predominate, Rose maybe present..
....**Pl-Aw/Forb/Marsh reed grass** h8

8. Well developed forb layer...**Aw-Sw/Rose/Forb** h9
Well developed grass layer.......................................**Pl-Aw-Sw/Rose/Hairy wildrye** h10

9. Rose is a dominant shrub in the community... 7
Alder, Labrador tea or snowberry dominate shrub layer.. 10

10. Alder is a dominant shrub in the community.......................................**Aw-Pl/Alder** **h6**
Labrdor tea or snowberry dominant shrub layer... 11

11. Labrador tea is the dominant shrub...............**Pl-Sw-Aw/Labrador tea/Feathermoss** h3
Snowberry is the dominant shrub..**Aw-Pl-Sw/Snowberry** h11

h1: Balsam Poplar- White Spruce/ Chokecherry- Bearberry

(Populus balsamifera- Picea glauca/ Prunus viginiana- Arctostaphylos uva-ursi)

n=1 This community type was found on a fluvial outwash between Brule Lake and Ogre Canyon on shallow, poor nutrient soils. The presence of Balsam Poplar and White Spruce indicates moisture availiability, however, the dominance of bearberry and chokecherry suggests drier, poorer nutrient conditions. This species diversity indicates a fluctuating soil moisture conditions, perhaps created from periodic flooding from spring run-off.

This community type has moderate forage production and dense shrub cover. In general the grazing potential of this community type declines as the density of the shrubs increases.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	25	-	100
WHITE SPRUCE *(Picea glauca)*	20	-	100
PAPER BIRCH *(Betula papyrifera)*	10	-	100
SHRUBS			
CHOKECHERRY *(Prunus virginiana)*	26	-	100
BEARBERRY *(Arctostaphylos uva-ursi)*	16	-	100
RIVER BIRCH *(Betula occidentalis)*	5	-	100
SASKATOON *(Amelanchier alnifolia)*	5	-	100
ROSE *(Rosa acicularis)*	3	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	3	-	100
FORBS			
EARLY BLUE VIOLET *(Viola adunca)*	6	-	100
SHOWY LOCOWEED *(Oxytropis splendens)*	4	-	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	3	-	100
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	2	-	100
GRASSES			
SEDGES *(Carex spp.)*	11	-	100
SHEEP FESCUE *(Festuca saximontana)*	5	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	-	100
ALPINE BLUE GRASS *(Poa alpina)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
RAPIDLY
ELEVATION:
1050M
SLOPE: 2%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	60
FORBS	334
SHRUBS	318
TOTAL	712

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

h2: Aspen- White Spruce/ Buffaloberry- Bearberry

(Populus tremuloides - Picea glauca/ Shepherdia canadensis- Arctostaphylos uva-ursi)

n=3 This community type resembles the Aw-Sw-Pl/Buffalo-berry community type described by Beckingham (1994) and is part of the low-bush cranberry ecosite described by Beckingham et al (1996) . It has the driest and the poorest nutrients of any community type within the mesic ecosites.

Since this community type has a low cover of conifer overstory, it still has a productive understory and is useful for grazing. Its importance as a source of forage mainly depends on how close it is to features that attract livestock (ie. water,grasslands, salt, trails, etc.). If it is close to an area that attracts livestock it will contribute to the carrying capacity of a lease. If it is not close to an area that attracts livestock, management strategies will have to be implemented before it will contribute to the carrying capacity of an area.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	45	30-75	100
WHITE SPRUCE *(Picea glauca)*	22	20-25	100
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	21	13-29	100
BEARBERRY *(Arctostaphylos uva-ursi)*	10	0-25	68
ROSE *(Rosa acicularis)*	10	7-15	100
TWIN-FLOWER *(Linnaea borealis)*	7	0-17	68
FORBS			
STRAWBERRY *(Fragaria virginiana)*	8	1-20	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	3-6	100
FIREWEED *(Epilobium angustifolium)*	2	1-2	100
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-2	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-4	68
ALPINE HEDYSARUM *(Hedysarum alpinum)*	1	1-2	67
COMMON RED PAINTBRUSH *(Castilleja miniata)*	3	0-6	67
AMERICAN VETCH *(Vicia americana)*	1	1	67
COMMON YARROW *(Achillea millefolium)*	1	0-2	67
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	13	6-25	100
SEDGES (*Carex spp.*)	2	2-4	68
MOSSES			
Moss spp.	18	1-41	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
900 - 1100 (1000)M
SLOPE: N/A
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=2

GRASS	258 (44-472)
FORBS	180 (90-270)
SHRUBS	120 (114-126)
TOTAL	558 (260-856)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (6.7-2.13)
0.10 AUM/ac (0.06-0.19)

h3: Lodgepole Pine- White Spruce- Aspen/ Labrador Tea/ Feathermoss

(Pinus contorta- Picea glauca- Populus tremuloides/ Ledum groenlandicum/ Moss spp.)

n=22 This community type corresponds to Beckingham's (1994) Pl-Aw-/Shrub ecosite phase and is part of the labrador tea -mesic ecosite (Archibald et al 1996). It is fairly dry and low in nutrients and more acidic soils relative to the modal for the Lower Foothills.

This community type does not produce much palatable forage. If it occurs fairly close to an area that is primary range it may get used.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	32	10-75	100
ASPEN *(Populus tremuloides)*	25	4-65	100
WHITE SPRUCE *(Picea glauca)*	16	0-60	86
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	11	0-33	96
ROSE *(Rosa acicularis)*	5	0-12	86
BOG CRANBERRY *(Vaccinium vitis-idaea)*	7	0-39	77
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	5	0-26	68
BUFFALOBERRY *(Shepherdia canadensis)*	3	0-9	55
FORBS			
TWINFLOWER *(Linnaea borealis)*	13	0-53	96
BUNCHBERRY *(Cornus canadensis)*	12	0-31	100
STRAWBERRY *(Fragaria virginiana)*	4	0-12	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	4	0-12	86
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	0-8	91
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-8	68
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	0-10	64
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-38	86
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-18	86
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	3	0-17	86
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-6	59
MOSSES			
Moss spp.	40	0-92	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
792 - 1572 (1009)M
SLOPE: 0 - 4%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=14

GRASS	220 (10-524)
FORBS	225 (50-514)
SHRUBS	193 (0-578)
TOTAL	637 (70-1304)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-2.70)
0.05 AUM/ac (0.01-0.15)

h4: Aspen- White Spruce/ Buffaloberry

(Populus tremuloides- Picea glauca/ Shepherdia canadensis)

n=9 This community type occupies similar sites to the Aw/Buffalo-berry (e3) community type, but is successionally more advanced and slightly drier than the modal Aw/rose-low bush cranberry (e7) community type . As white spruce increases, the abundance of tall forbs declines as they are replaced by low-growing, shade-tolerant species. As the tall forb layer declines, so does the productivity of the site. Eventually this community type will succeed to a Sw/moss (j12) or a Sw/Horsetail/Moss (j17) community type on moister sites.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	19	10-35	100
ASPEN *(Populus tremuloides)*	38	8-65	100
BALSAM POPLAR *(Populus balsamifera)*	13	0-10	44
SHRUBS			
ROSE *(Rosa acicularis)*	14	5-25	100
BUFFALOBERRY *(Shepherdia canadensis)*	12	2-25	100
TWINFLOWER *(Linnaea borealis)*	7	1-13	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	3	0-13	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-10	78
BOG CRANBERRY *(Vaccinium vitis-idaea)*	3	0-12	44
WHITE MEADOWSWEET *(Spriraea betulifolia)*	3	0-13	33
FORBS			
BUNCHBERRY *(Cornus canadensis)*	9	5-13	100
FIREWEED *(Epilobium angustifolium)*	6	0-16	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	5	1-13	100
PALMATED COLTSFOOT *(Petasites palmatus)*	4	1-7	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-4	100
STRAWBERRY *(Fragaria virginiana)*	2	0-5	89
LINDELY'S ASTER *(Aster ciliolatus)*	3	0-6	78
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-11	100
HAIRY WILD RYE *(Elymus innovatus*	3	0-6	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
745 - 899 (806)M
SLOPE: 1-8%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=7

GRASS	115 (12-356)
FORBS	402 (150-796)
SHRUBS	223 (76-480)
TOTAL	739 (422-1070)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3.37 HA/AUM (4-1.35)
0.12 AUM/ac (0.10-0.3)

h5: Aspen- Lodgepole Pine/ Buffalo-berry

(Populus tremuloides- Pinus contorta/ Shepherdia canadensis)

n=2 This community type is similar to Aw-Sw-Pl/buffalo-berry/hairy wild rye described by Beckingham et al (1996). The prominence of aspen indicates that it is relative early succession as lodgepole pine and later white spruce will begin to dominant with later succession stands. The diversity of shrubs has restricted the herbaceous growth to low forbs with little grass cover.

This community type does not produce very much palatable forage in its present state and is expected to produce less as white spruce exerts more dominance over the site.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	15	15-15	100
TREMBLING ASPEN *(Populus tremuloides)*	28	25-30	100
WHITE SPRUCE *(Picea glauca)*	3	2-3	100
SHRUBS			
ROSE *(Rosa acicularis)*	11	3-19	100
BUFFALOBERRY *(Shepherdia canadensis)*	10	2-17	100
TWIN-FLOWER *(Linnaea borealis)*	6	3-9	100
WILLOW *(Salix bebbiana)*	5	2-7	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	2	1-3	100
DWARF BILBERRY *(Vaccinium caespitosum)*	2	1-2	100
FORBS			
BUNCHBERRY *(Cornus canadensis)*	13	9-17	100
STRAWBERRY *(Fragaria virginiana)*	3	0-4	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	2-2	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	6	5-5	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	2-4	100
HAIRY WILD RYE *(Elymus innovatus)*	1	0-1	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
613-643 (628)M
ECOLGOICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=2

GRASS	61 (58-64)
FORBS	311 (276-346)
SHRUBS	196 (2-390)
TOTAL	568 (406-730)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (4.5-2.5)
0.10 AUM/ac (0.09-0.16)

h6: Aspen-Lodgepole Pine/Alder

(Populus tremuloides - Pinus contorta/ Alnus crispa)

n=10 This community type occurs on fairly coarse, moderately well drained parent material. It corresponds to Aw-Sw-Pl/green alder (Beckingham et al 1996) and is thought to represent a transition from the modal aspen to the dry lodgepole pine dominated types in the Upper Foothills Subregion. Beckingham also felt that the presence of white spruce in the canopy suggests succession to Sw/ Feathermoss or Sw - Fb/ Feathermoss associations if white spruce density is high or a Sw/ Vibu edu/ Feathermoss association if white spruce density is low. The presence of green alder indicates a slightly higher moisture availability, compared to the modal, likely created by an impermeable soil layer.

Generally, this community type is not useful for livestock grazing because it does not produce good quality forage.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	29	1-40	100
LODGEPOLE PINE *(Pinus contorta)*	17	4-30	100
WHITE SPRUCE *(Picea glauca)*	7	0-10	70
SHRUBS			
GREEN ALDER *(Alnus crispa)*	27	2-70	100
ROSE *(Rosa acicularis)*	5	1-12	100
LOW BUSH CRANBERRY *(Viburnum edule)*	5	0-20	80
WHITE MEADOWSWEET *(Spriraea betulifolia)*	4	0-18	60
FORBS			
BUNCHBERRY *(Cornus canadensis)*	21	2-97	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	7	1-17	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	5	0-20	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	2	0-5	100
TWINFLOWER *(Linnaea borealis)*	7	0-25	80
BISHOP'S-CAP *(Mitella nuda)*	5	0-16	80
FIREWEED *(Epilobium angustifolium)*	5	0-18	80
STRAWBERRY *(Fragaria virginiana)*	3	0-15	80
WILD SARSAPARILLA *(Aralia nudicaulis)*	13	0-44	70
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-14	100
HAIRY WILD RYE *(Elymus innovatus)*	2	0-16	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
868 - 1240 (1042)M
SLOPE: 0 - 12%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=4

GRASS	58 (18-112)
FORBS	334 (166-628)
SHRUBS	428 (102-825)
TOTAL	820 (364-1295)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (40-2)
0.10 AUM/ac (0.01-0.20)

h7: Aspen - Balsam Poplar-White Spruce/ Alder

(Populus tremuloides - Populus balsamifera-Picea glauca/ Alnus spp.)

n=9 This community type represents an Aw-Pb/Alder/Marsh reed grass (f6) community that is undergoing succession towards a white spruce-dominated canopy. Beckingham (1993) described the succession of a similar community type, his Pb-Aw/Green Alder type. Beckingham stated that the density of spruce in the climax canopy determines if the climax community will be in the Sw/Green Alder/Feathermoss or the Sw-Fb/Feathermoss association. This is because green alder has a low tolerance to shade. Therefore these communities tend to be fairly open. The presence of alder, wild sarsaparilla and a high cover of balsam poplar are indicative of the high soil moisture regime and nutrient content of this community. Abundance of river alder increases as you move to lower slope positions where soil moisture increases.

This community type does not produce much palatable forage in its present state and is expected to produce less as white spruce exerts more dominance over the site.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	33	15-70	100
WHITE SPRUCE *(Picea glauca)*	17	1-35	100
BALSAM POPLAR *(Populus balsamifera)*	9	0-35	50
SHRUBS			
ALDER *(Alnus crispa or tenuifolia)*	16	0-50	90
ROSE *(Rosa spp.)*	11	2-35	100
LOW BUSH CRANBERRY *(Viburnum edule)*	6	0-14	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-7	70
BUFFALOBERRY *(Shepherdia canadensis)*	4	0-15	40
FORBS			
BUNCHBERRY *(Cornus canadensis)*	9	0-21	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	12	0-75	40
FIREWEED *(Epilobium angustifolum)*	5	1-19	100
BISHOP'S-CAP *(Mitella nuda)*	3	0-6	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-12	90
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-12	90
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-6	90
STRAWBERRY *(Fragaria virginiana)*	3	0-8	80
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-35	90
HAIRY WILD RYE *(Elymus innovatus)*	4	0-21	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
729 - 1220 (920)M
SLOPE: 0 - 15%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=3

GRASS	171 (60-256)
FORBS	253 (150-360)
SHRUBS	189 (18-366)
TOTAL	613 (366-798)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (40-2)
0.10 AUM/ac (0.01-0.20)

h8: Lodgepole Pine - Aspen/ Forb/ Marsh Reedgrass

(*Pinus contorta -Populus tremuloides / Forb/ Calamagrostis canadensis*)

n=3 This community type appears to represent the transition from an aspen to a pine dominated community. This community occurs on mesic well to moderately well drained nutrient medium sites. This community is similar to the Aw-Pl/ Low bush cranberry community type described by Beckingham (1993) and is part of the low-bush cranberry ecosite described by Beckingham et al (1996). The distinguishing factor of this community type is the predominance of tall growing forbs (fireweed, peavine, and occassionally wild sarsaparilla).

The forage production in this community type is normaily good, but it is related to stand density. The majority of the vegetation in this community type is palatable to livestock, and when this community type is productive and accessible to livestock it would normally be considered to have good grazing potential. However if the canopy is closed and forage production is poor or if livestock access is limited this community type has less grazing potential.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	45	35-60	100
ASPEN *(Populus tremuloides)*	17	15-20	100
WHITE SPRUCE *(Picea glauca)*	6	2-10	100
SHRUBS			
WILLOW *(Salix spp.)*	5	0-10	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	5	4-5	100
ROSE *(Rosa acicularis)*	2	0-4	67
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-4	67
FORBS			
CREAM - COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	8	0-22	100
FIREWEED *(Epilobium angustifolium)*	7	2-12	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	5	1-7	100
TWIN-FLOWER *(Linnaea borealis)*	4	0-7	100
STRAWBERRY *(Fragaria virginiana)*	3	0-6	100
BUNCHBERRY *(Cornus canadensis)*	3	2-4	100
RUNNING RASPBERRY OR DEWBERRY *(Rubus pubescens)*	3	1-4	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-12	33
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	9	2-21	100
HAIRY WILD RYE *(Elymus innovatus)*	5	0-11	67
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-3	67
MOSSES			
Moss spp.	10	0-26	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
660 - 1097 (941)M
SLOPE: 0 - 5 %
ASPECT: EASTERLY
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=1

GRASS	200
FORBS	500
SHRUBS	100
TOTAL	800

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.89 HA/AUM (4-2)
0.14 AUM/ac (0.10-0.20)

h9: Aspen - White Spruce/ Rose/ Forb

(Populus tremuloides - Picea glauca/ Rosa acicularis/ Forb)

n=60 This community type is similar to the Aw/Rose/tall forb(e7) community type, but is successionally more advanced. As spruce succeeds into the canopy, it reduces the amount of light reaching the forest floor inhibiting the growth of shrubs, tall forbs and grass. Grazing can also reduce the tall forb component as low-growing forbs (strawberry, common pink wintergreen) will increase, and with continual grazing revert to clover and kentucky bluegrass (i1 Aw-Sw/clover --- characterized by lower forage production). Under natural succession this community will eventually revert to a Sw/moss (j12) on mesic/medium sites and Sw/horsetail/moss (j17) on higher moisture-nutrient sites.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	33	10-70	100
WHITE SPRUCE *(Picea glauca)*	25	0-80	98
SHRUBS			
ROSE *(Rosa acicularis)*	11	0-35	98
LOW BUSH CRANBERRY *(Viburnum edule)*	5	0-35	68
TWIN-FLOWER *(Linnaea borealis)*	7	0-21	87
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	0-17	53
FORBS			
BUNCHBERRY *(Cornus canadensis)*	11	0-29	98
STRAWBERRY *(Fragaria virginiana)*	5	0-19	98
PALMATED COLTSFOOT *(Petasites palmatus)*	3	0-14	88
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	5	0-21	87
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-15	85
RUNNING RASPBERRY OR DEWBERRY *(Rubus pubescens)*	4	0-30	83
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-18	82
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	7	0-30	92
HAIRY WILD RYE *(Elymus innovatus)*	5	0-26	68

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
671 - 1234 (916)M
SLOPE: 0 - 15%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=42

GRASS	237 (2-842)
FORBS	360 (10-892)
SHRUBS	183 (0-708)
TOTAL	781 (70-1870)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.25 HA/AUM (8-2)
0.18 AUM/ac (0.05-0.20)

h10: Lodgepole Pine -White Spruce - Aspen/ Rose/ Hairy Wild Rye

(Pinus contorta - Picea glauca - Populus tremuloides/ Rosa acicularis/ Elymus innovatus)

n=7 This community type fits into Beckingham's (1994) Aw-Sw-Pl/ Shrub ecosite Phase and is part of the hairy wild rye or low-bush cranberry ecosites described by Beckingham et al (1996). It has developed under somewhat drier conditions, thus the predominance of lodgepole pine. As this community succeeds towards climax, aspen will be removed from the stand, and white spruce will eventually become dominant.

This community type is fairly productive and provides good grazing opportunities for domestic livestock. As the community succeeds towards maturity a closed canopy will develop and forage production will decline.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	26	0-85	86
LODGEPOLE PINE *(Pinus contorta)*	19	0-50	86
TREMBLING ASPEN *(Populus tremuloides)*	15	4-25	100
SHRUBS			
TWIN-FLOWER *(Linnaea borealis)*	10	5-14	100
BUFFALO BERRY *(Shepherdia canadensis)*	7	0-10	100
PRICKLY ROSE *(Rosa acicularis)*	6	0-15	86
BOG CRANBERRY *(Vaccinium vitis-idaea)*	4	0-7	86
DWARF BILBERRY *(Vaccinium caespitosum)*	2	0-8	86
WILLOW *(Salix spp.)*	3	0-10	57
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	2-11	100
BUNCHBERRY *(Cornus canadensis)*	6	2-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	0-13	86
FIREWEED *(Epilobium angustifolium)*	4	0-9	86
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-8	86
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	12	3-21	100
MARSH REED GRASS *(Calamagrostis canadensis)*	5	0-12	86

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
1151- 1572 (1281)M
SLOPE: 0 - 20%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=3

GRASS	319 (68-842)
FORBS	288 (128-892)
SHRUBS	210 (54-708)
TOTAL	816 (582-1870)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.5 HA/AUM (8-2)
0.16 AUM/ac (0.05-0.20)

h11: Aspen - Pine - White Spruce/ Snowberry

(Populus tremuloides - Pinus contorta - Picea glauca/ Symphoricarpos occidentalis)

n=2 This community type was found north of Hinton along the south banks of the Athabasca River. Upper slopes consisted of drier Sw-Pl stands, with higher moisture to down slope towards the river flat as indicated by the predominance of snowberry. The presence of aspen will eventually revert to a predominantly white spruce stand created by the moisture, which will lower understory species diversity and production.

This community has received some moderate level of grazing by the presence of kentucky bluegrass.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	36	35-35	100
LODGEPOLE PINE *(Pinus contorta)*	10	0-20	50
JACK PINE *(Pinus banksiana)*	15	15-15	100
WHITE SPRUCE *(Picea glauca)*	13	10-15	100
SHRUBS			
ROSE *(Rosa acicularis)*	20	18-22	100
SNOWBERRY *(Symphoricarpos occidentalis)*	18	6-28	100
BUFFALOBERRY *(Shepherdia canadensis)*	4	1-6	100
TWINFLOWER *(Linnaea borealis)*	1	1-1	100
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-7	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	2-3	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-4	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	0-5	50
RUNNING RASPBERRY OR DEWBERRY *(Rubus pubescens)*	2	0-4	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-13	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	5	0-10	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
910-950 (930)M
SLOPE: 7-9%
ECOLOGICAL STATUS SCORE: 18-12

FORAGE PRODUCTION (KG/HA)n=2

GRASS	144 (128-160)
FORBS	216 (164-268)
SHRUBS	531 (518-544)
TOTAL	891 (842-940)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
3.37 HA/AUM (8-2.25)
0.12 AUM/ac (0.05-0.18)

h12: Aspen- White Spruce- Balsam Poplar/ Bracted Honeysuckle

(Populus tremuloides- Picea glauca- Populus balsamifera/ Lonicera involucrata)

n=2 This community type is similar to Aw-Sw-Pl/bracted honeysuckle/fern type described by Beckingham et al (1996). It is adapted from a higher moisture-nutrient relative to the modal type for the Lower Foothills, as indicated by the predominance of Pb, Bw, and bracted honeysuckle. With succession this community may revert to a Sw/bracted honeysuckle/fern and eventually to a Sw/moss (j12) or Sw/horsetail/moss(j17) type. This community type is quite productive, however grazing suitability is species density-dependent and is less suitable in towards successional climax.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	25	5-40	100
WHITE SPRUCE			
(Picea glauca)	25	7-25	100
BALSAM POPLAR			
(Populus balsamifera)	14	6-20	100
WHITE OR PAPER BIRCH			
(Betula papyrifera)	15	0-30	50
SHRUBS			
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	4	3-4	100
SNOWBERRY			
(Symphoricarpos occidentalis)	5	1-8	100
ROSE			
(Rosa acicularis)	2	1-3	100
FORBS			
BISHOP'S-CAP			
(Mitella nuda)	5	4-5	100
BUNCHBERRY			
(Cornus canadensis)	4	2-5	100
TALL LUNGWORT OR BLUEBELLS			
(Mertensia paniculata)	3	2-4	100
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	3	1-5	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	2-4	100
LINDLEY'S ASTER			
(Aster ciliolatus)	2	1-3	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	2	1-2	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	2	1-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO IMPERFECTLY
ELEVATION:
N/A
SLOPE: 1-3 %
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL	900*

*ESTIMATED

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-2.5)
0.05 AUM/ac (0.01-0.16)

GRAZED MODIFIED MIXEDWOOD FOREST COMMUNITY TYPES OF THE LOWER FOOTHILLS SUBREGION

Photo 14: A grazed modified, Aspen - White Spruce/ Clover mixedwood community type within the Lower Foothills subregion. With heavy grazing pressure the forage production has declined. As this stand succeeds toward climax and spruce becomes dominant, the canopy becomes closed and understory production further declines.

i1: Aspen - White Spruce/ Clover

(Populus tremuloides - Picea glauca/ Trifolium spp.)

n=10 This community type represents a heavily grazed Aspen - White Spruce/ Rose/ Forb (h9). With heavy grazing, clover and dandelion have increased while the abundance of native vegetation has decreased. This community type, as a result from over-grazing, has become less productive relative to the lightly to moderately grazed Aw-Sw/Rose/Forb community type.

This mixedwood community type seems to be fairly productive and will provide good grazing opportunities for domestic livestock providing over-grazing does not continue to occur. The stocking rate has been lowered to help ensure no further decline in range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	35	15-60	100
WHITE SPRUCE *(Picea glauca)*	18	0-60	90
LODGEPOLE PINE *(Pinus contorta)*	12	0-35	80
BLACK SPRUCE *(Picea mariana)*	2	0-15	20
SHRUBS			
ROSE *(Rosa acicularis)*	5	0-13	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	3	0-12	50
WILLOW *(Salix spp.)*	3	0-19	50
FORBS			
CLOVER *(Trifolium spp.)*	23	1-60	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-9	100
STRAWBERRY *(Fragaria virginiana)*	5	0-14	90
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-12	90
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-2	90
TWIN-FLOWER *(Linnaea borealis)*	7	0-27	80
DANDELION *(Taraxacum officinale)*	2	0-6	80
BUNCHBERRY *(Cornus canadensis)*	3	0-9	70
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-10	70
GRASSES			
PURPLE OAT GRASS *(Schizachne purpurascens)*	3	0-11	90
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-19	80
HAIRY WILD RYE *(Elymus innovatus)*	4	0-17	80
MARSH REED GRASS *(Calamagrostis canadensis)*	2	0-9	70
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	5	0-21	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
960 -1572 (1186)M
SLOPE: 0 - 3%
ECOLOGICAL STATUS SCORE: 0

FORAGE PRODUCTION (KG/HA)

GRASS	161 (4-318)
FORBS	220 (182-258)
SHRUBS	115 (84-146)
TOTAL	496 (332-660)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (40-2.7)
0.10 AUM/ac (0.01-0.15)

LOWER FOOTHILLS SUBREGION

CONIFEROUS FOREST COMMUNITIES

Photo 15: An open pine-dominated community type within the Lower Foothills subregion. As this stand succeeds to maturity, the spruce in the secondary canopy will become dominant.

CONIFEROUS FORESTS

Throughout the Lower Foothills subregion coniferous forest occurs either on lowland sites that have a high water table or on well drained, upland sites. The coniferous forests described here span 8 ecosites as described by Beckingham et al (1996) from submesic/medium to subhydric/rich. On sites with submesic moisture and medium nutrient regimes, the dry conditions are a result of either coarse-textured, rapidly-drained soils, or southerly aspects. Species indicating dry sites such as bearberry, bog cranberry and lichens are common (Pl/Bog cranberry/ Hairy wild rye; Pl/Bearberry/Hairy wild rye). Shrub layers are generally poorly developed and succession to spruce is very slow due to the dry site conditions.

On the mesic/poor to mesic/medium sites, the understory shrub and forb layers become slightly more developed and white spruce becomes more prevalent in the overstory (Pl/fireweed; Pl/green alder). Labrador tea and bog cranberry (j4 Pl-Sb/labrador tea/feathermoss to j7 Pl/labrador tea-bearberry) are indicative of relatively acidic surface soil conditions and thereby are lower in available soil nutrients (Beckingham 1996). These community types generally have limited potential for livestock grazing.

The modal ecosite for the Lower Foothills subregion is the mesic/medium low-bush cranberry ecosite. Aspen and lodgepole pine stands are prevalent in the area due to high fire frequency. Young stands of aspen and lodgepole pine generally have a higher grass and shrub layer and thus can provide some forage for domestic livestock (Pl/kentucky bluegrass/clover; Pl/green alder; Sw/kentucky bluegrass/clover). After canopy closure, shrub species become more prevalent than grass and forbs (Pl-Sw/Twinflower/Moss; Sw/Buffaloberry). In older stands, moss becomes more dominant as light levels decrease and forbs and shrubs are shaded out (Sw/Moss).

As moisture and nutrients increase, such as on seepage areas, the understory becomes especially well-developed (Sw/Alder; Sw/willow-bracted honeysuckle; Se-Pl/Cow parsnip). Often a dense shrub understory will inhibit access for cattle (thus making some of these areas non-use despite an abundance of forage) as well as inhibit regrowth of spruce seedlings after disturbance such as fire and logging (Archibald et al 1996). Engelmann spruce is generally not found in the Lower Foothills subregion, thus its presence here may indicate a transition to the higher elevation Upper Foothills subregion.

Black spruce and larch communities dominate on wetter, lowland sites with subhygric to subhydric moisture regimes and poor to rich nutrient regimes. Generally, larch is more tolerant of excessive moisture and is indicative of an enriched nutrient status, while black spruce is typical in areas of stagnating ground water with poor nutrient status (Hay et al 1985). These community types have very limited potential for livestock grazing.

Figures 15 and 16 illustrate how these conifer community types are arranged in the landscape.

Table 11. Forage production summary for coniferous community types of the Lower Foothills subregion

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
c hairy wild rye submesic/ medium	**Ecosite phase**	**c1 hairy wild rye Pl**						**8 (0.05)**
	j1	Pl/bearberry/hairy wild rye	291	124	109	524	40-4 (0.01-0.10)	8 (0.05)
	j2	Pl/bog cranberry/hairy wild rye	196	220	102	485	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**c1_harvest Pl**						**8 (0.05)**
	l1	WGMG/bearberry/Pl-Aw	293	309	284	886	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**c4 hairy wild rye Sw**						**8 (0.05)**
	j3	Sw/buffalo-berry-bearberry	146	198	124	468	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**c4_harvest Sw**						
	l3	buffalo-berry/bearberry/Sw	432	765	222	1419		
d labrador tea - mesic mesic/poor	**Ecosite phase**	**d1 labrador tea - mesic - Pl-Sw**						**40 (0.01)**
	j4	Pl-Sb/labrador tea/feathermoss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
	j5	Pl-Sb/feathermoss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
	Ecosite phase	**d2 labrador tea - mesic Pl**						**8 (0.05)**
	j6	Pl/labrador tea-bog cranberry	121	235	439	800	40-4 (0.01-0.10)	8 (0.05)

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	j7	Pl/labrador tea-bearberry	239	435	432	1106	40-4 (0.01-0.10)	8 (0.05)
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e1 low-bush cranberry-Pl**						**8 (0.05)**
	j8	Pl/alder	n/a	n/a	n/a	n/a	40-4 (0.01-0.10)	8 (0.05)
	j9	Pl/fireweed	200	350	60	610	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e1_ grazed Pl**						**40 (0.01)**
	k1	Pl/kentucky bluegrass/clover	336	672	336	1344	40-1.35 (0.01-0.30)	40 (0.01)
	Ecosite phase	**e1_harvest Pl**						**8 (0.05)**
	l4	Pl/hairy wild rye/rose	578	419	88	1084	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e1_harvest_grazed Pl**						**20 (0.02)**
	m1	Aw-Pl/alder/clover/kentucky bluegrass	885	821	503	2210	40-4 (0.01-0.10)	20 (0.02)
	Ecosite phase	**e3 low-bush cranberry Aw-Sw-Pl**						**8 (0.05)**
	j10	Pl-Sw/twinflower/moss	103	282	154	539	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e4 low-bush cranberry Sw**						**24 (0.03)**
	j11	Sw/buffalo-berry	18	46	95	160	40 (0.01)	40 (0.01)

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	j12	Sw/moss	105	307	105	516	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e4_grazed Sw**						**40 (0.01)**
	k2	Sw/kentucky bluegrass/clover	48	598	132	778	40-1.35 (0.01-0.3)	40 (0.01)
	Ecosite phase	**e4_harvest Sw**						**8 (0.05)**
	l9	moss/marsh reedgrass	1184	455	116	1755	40-4 (0.01-0.10)	8 (0.05)
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f3 bracted honeysuckle Aw-Sw-Pl**						**2 (0.2)**
	j13	Se-Pl/cow parsnip	1490	352	175	2014	4-1 (0.10-0.40)	2 (0.20)
	Ecosite phase	**f4 bracted honeysuckle Sw**						**8 (0.05)**
	j14	Sw/willow-bracted honeysuckle	63	425	159	646	40-4 (0.01-0.10)	8 (0.05)
	j15	Sw/alder	28	332	124	484	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**f4_harvest Sw**						**8 (0.05)**
	l15	Sw/willow/marsh reedgrass	761	846	1	1608	40-4 (0.01-0.10)	8 (0.05)
h labrador tea - subhygric subhygric/ poor	**Ecosite phase**	**h1 labrador tea-subhygric-Sb-Pl**						**40 (0.01)**
	j16	Sb-Pl/moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
	Ecosite phase	**h1_harvest Sb-Pl**						**40 (0.01)**

Ecological site	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	l16	Pl-Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
i horsetail hygric/rich	**Ecosite phase**	**i3 horsetail Sw**						**40 (0.01)**
	j17	Sw/horsetail/moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
j labrador tea/ horsetail hygric /medium	**Ecosite phase**	**j1 Sb-Sw/labrador tea/horsetail**						**40 (0.01)**
	j18	Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
	Ecosite phase	**j1_harvest Sb-Sw**						**40 (0.01)**
	l17	willow/hair-like sedge/Sw	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
k bog subhydric/ poor	**Ecosite phase**	**k1 treed bog**						**40 (0.01)**
	j19	Sb/labrador tea-bog cranberry/cloudberry	23	335	786	1144	40 (0.01)	40 (0.01)
l poor fen subhydric/ medium	**Ecosite phase**	**l1 treed poor fen**						**40 (0.01)**
	j20	Sb-Lt/sedge/moss	377	242	137	757	40 (0.01)	40 (0.01)
m rich fen subhydric/ rich	**Ecosite phase**	**m1 treed rich fen**						**40 (0.01)**
	j21	Lt/bog birch/sedge moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)

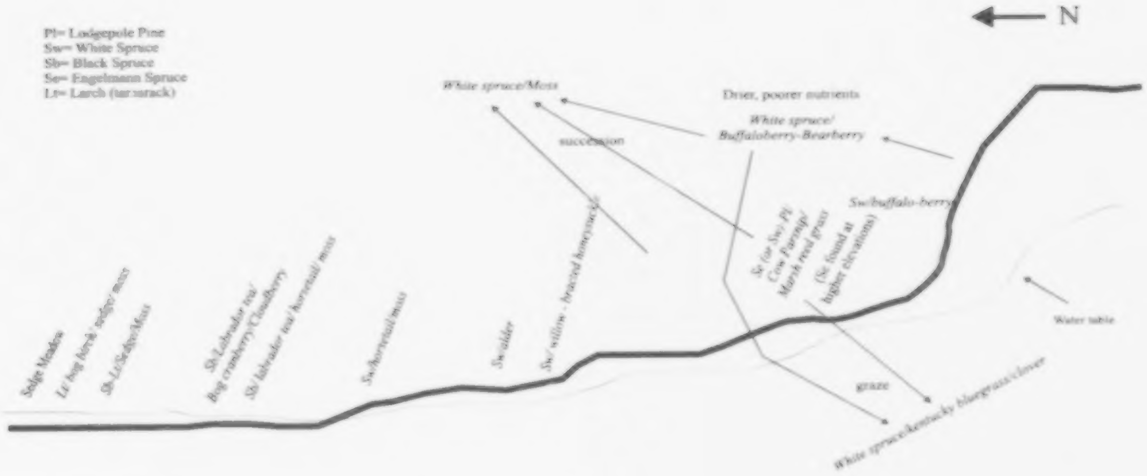

Pl= Lodgepole Pine
Sw= White Spruce
Sb= Black Spruce
Se= Engelmann Spruce
Lt= Larch (tamarack)
N
White spruce/Moss
Drier, poorer nutrients
White spruce/
Buffaloberry-Bearberry
succession
Sw/buffalo-berry
Se (or Sw)-Pl
Cow Parsnip/
Marsh reed grass
(Se found at
higher elevations)
Water table
Sedge Meadow
Lt/ bog birch/ sedge/ moss
Sb-Lt/Sedge/Moss
Sb/Labrador tea/
Bog cranberry/Cloudberry
Sb/ labrador tea/ horsetail/ moss
Sw/horsetail/moss
Sw/alder
Sw/ willow - bracted honeysuckle
graze
White spruce/kentucky bluegrass/clover

Figure 15. Landscape profile of conifer (Sb, Sw) community types of the Lower Foothills Subregion.

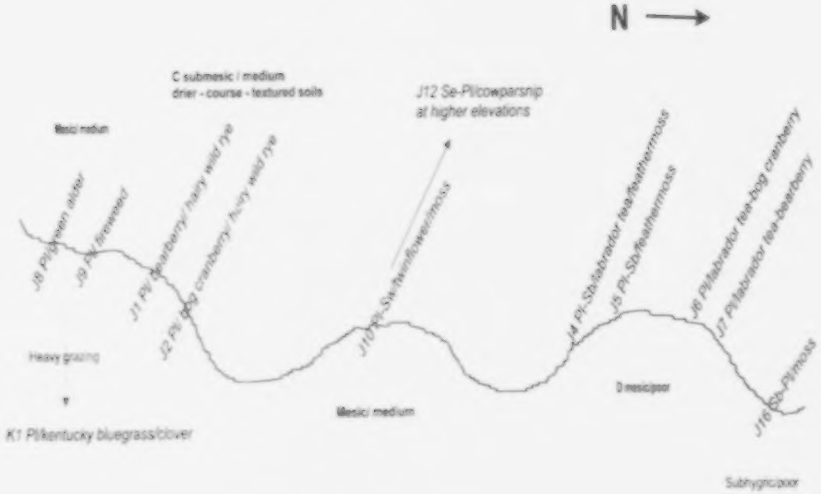

N →
C submesic / medium
drier - course - textured soils
J12 Se-Pl/cowparsnip
at higher elevations
Mesic/ medium
J8 Pl/green alder
J9 Pl/fireweed
J1 Pl/ bearberry/ hairy wild rye
J2 Pl/ bog cranberry/ hairy wild rye
J10 Pl-Sw/twinflower/moss
J4 Pl-Sb/labrador tea/feathermoss
J5 Pl-Sb/feathermoss
J6 Pl/labrador tea-bog cranberry
J7 Pl/labrador tea-bearberry
Heavy grazing
K1 Pl/kentucky bluegrass/clover
Mesic/ medium
D mesic/poor
J16 Sb-Pl/moss
Subhygric/poor

Figure 16. Landscape profile of pine dominated conifer community types of the Lower Foothills Subregion.

Figure 17. Coniferous forest community type key

1. White spruce dominated communities.................................... **2**
Community dominated by Black spruce, Larch, or Lodgepole pine (White spruce maybe present but in low quantities).. **6**

2. Drier nutrient poor sites dominated by Buffalo berry.................... **3**
Mesic to moist sites dominated by horsetail, moss or grazed communities dominated by Kentucky bluegrass and clover.................................... **4**

3. Dry sandy sites, dominated by Bearberry ....**Sw/Buffaloberry-Bearberry** j3
No significant amount of bearberry....................**Sw/Buffaloberry** j11

4. Ungrazed sites dominated by moss or horsetail.............................. **5**
Heavy grazing has caused Clover to dominate and an increase in non native species such as Kentucky bluegrass....................**Sw/Kentucky bluegrass/Clover** k2

5. Site is wet and nutrient rich, lots of horsetail....................**Sw/Horsetail/Moss** j17
Site is drier with only shade tolerant mosses and forbs....................**Sw/Moss** j12

6. Dominated by Black spruce or Larch (Lodgepole pine is absent, or represented by scattered individual trees).. **7**
Dominated by Lodgepole pine or Engelmann spruce on higher elevation sites (black spruce may co-dominate site).. **10**

7. Poorer nutrient sites dominated by Labrador tea in understory.................... **8**
Richer sites dominated by bog birch, sedge and moss.................... **9**

8. Horsetail is a dominant forb in the community ......**Sb/Labrador tea/Horsetail/Moss** j18
Bog cranberry/cloudberry are dominant...**Sb/Labrador tea/B.cranberry/Cloudberry** j19

9. Black spruce is predominant....................**Sb-Lt/Sedge/Moss** j20
Black spruce-Larch are co-dominant, bog birch present......**Lt/Bog birch/Sedge/Moss** j21

10. Higher elevation sites dominated by Engelmann spruce and Lodgepole pine.............. **11**
Mesic sites dominated by Lodgepole pine (maybe co-dominated by black spruce or white spruce.. **12**

11. Moist seepage area dominated by cow parsnip....................**Se-Pl/Cow parsnip** j13
Mesic site with moss dominating understory....................**Se-Pl/Moss** j16

12. Mesic to submesic sites dominated by Lodgepole pine, low cover of White and Black spruce **15**
Mesic to moist site co-dominated by white and black spruce.................... **13**

Figure 18. Key to Lodgepole pine dominated coniferous forest

13. Site dominated by lodgepole pine and white spruce............**Pl-Sw/Twinflower/moss** j10
Site dominated by lodgepole pine and black spruce.. **14**

14. Labrador tea dominates understory......................**Pl-Sb/Labrador tea/Feathermoss** j4
Labrador tea low in cover in understory......................................**Pl-Sb/Feather moss** j5

15. Drier sites dominated by hairy wildrye, bearberry and bog cranberry......................... **16**
Mesic sites with medium and poor nutrient regimes dominated by labrador tea, alder, fireweed or grazed sites dominated by Kentucky bluegrass and clover...................... **17**

16. Bearberry present..**Pl/Bearberry/Hairy wildrye** j1
Bog cranberry present..**Pl/Bog cranberry/Hairy wildrye** j2

17. Grazed lodgepole pine stands dominated by Kentucky bluegrass, clover and dandelion in the understory...**Pl/K.bluegrass/Clover** k1
Ungrazed lodgepole pine stands dominated by labrador tea, alder, moss, fireweed... **18**

18. Poorer nutrient sites with labrador tea dominant in the understory.............................. **19**
Richer sites dominated by alder, twinflower, fireweed, moss....................................... **20**

19. Bog cranberry is in the shrub layer.........................**Pl/Labrador tea-Bog cranberry** j6
Bearberry is part of the shrub layer...............................**Pl/Labrador tea-Bearberry** j7

20. Green alder dominates...**Pl/Green alder** j8
Fireweed dominates...**Pl/Fireweed** j9

j1: Lodgepole Pine/ Bearberry/Hairy Wild Rye

(Pinus contorta/ Arctostaphylos uva-ursi/ Elymus innovatus)

n=7 This community type occurs on coarse, well drained soils with poor nutrient regimes. These sites also tend to be dry as indicated by the predominance of hairy wild rye and bearberry. This community type occurs on a wide variety of site locations as long as the soil parent material is coarse, low in nutrients, and receives no underground seepage water. It is similar tothe Pl/buffalo-berry/hairy wild rye type described by Beckingham et. al. 1996.

This community type has limited forage production for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	46	30-60	100
ASPEN			
(Populus tremuloides)	3	0-11	43
WHITE SPRUCE			
(Picea glauca)	4	0-15	29
SHRUBS			
BEARBERRY			
(Arctostaphylos uva-ursi)	27	9-52	100
ROSE			
(Rosa acicularis)	7	1-19	100
BOG CRANBERRY			
(Vaccinium vitis-idaea)	6	0-12	71
BUFFALOBERRY			
(Shepherdia canadensis)	6	0-20	71
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	7	0-34	57
WILLOW			
(Salix spp.)	3	0-15	57
DWARF BILBERRY			
(Vaccinium caespitosum)	5	0-21	43
FORBS			
STRAWBERRY			
(Fragaria virginiana)	7	0-12	100
TWIN-FLOWER			
(Linnaea borealis)	16	0-27	86
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-13	86
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	4	0-12	71
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	2	0-4	71
BUNCHBERRY			
(Cornus canadensis)	3	0-9	57
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	10	0-16	100
UPLAND SEDGES			
(Carex spp.)	1	0-3	57
PURPLE OAT GRASS			
(Schizachne purpurascens)	3	0-14	43
MOSSES			
MOSS			
(Moss spp.)	38	0-80	86

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
841 - 1140 (961)M
SLOPE: 0 - 3%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=3

GRASS	291 (48-640)
FORBS	124 (77-200)
SHRUBS	109 (0-194)
TOTAL	524 (278-840)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j2: Lodgepole Pine/ Bog Cranberry/ Hairy Wild Rye

(Pinus contorta/ Vaccinium vitis-idaea/ Elymus innovatus)

n=11 This community type occurs on fairly coarse, well drained parent material, which makes the site fairly dry with a poor nutrient regime.

This community type corresponds to Beckingham's (1993) Pl - Aw/ Hylo spl - Pleu sch association. According to Beckingham (1993), this community type is thought to represent a transition from the aspen to the lodgepole pine dominated types in the Lower Foothills subregion. He also felt that the presence of white spruce in the canopy suggests succession to his Sw/ Feathermoss or Sw - Fb/ Feathermoss associations.

Generally, this community type has limited potential for livestock grazing because it does not produce good quality forage.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	52	20-65	100
WHITE SPRUCE *(Picea glauca)*	6	0-20	55
SHRUBS			
BOG CRANBERRY *(Vaccinium vitis-idaea)*	18	0-36	91
ROSE *(Rosa acicularis)*	6	1-18	100
BUFFALO-BERRY *(Shepherdia canadensis)*	5	0-21	73
DWARF BILBERRY *(Vaccinium caespitosum)*	5	0-19	73
FORBS			
BUNCHBERRY *(Cornus canadensis)*	11	1-23	100
TWINFLOWER *(Linnaea borealis)*	6	1-11	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	4	0-14	91
HEART-LEAVED ARNICA *(Arnica cordifolia)*	2	0-11	73
FIREWEED *(Epilobium angustifolium)*	2	0-5	73
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-8	73
STRAWBERRY *(Fragaria virginiana)*	4	0-12	64
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	64
COLTSFOOT *(Petasites palmatus)*	1	0-6	64
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-11	46
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	14	3-39	100
MARSH REED GRASS *(Calamagrostis canadensis)*	2	0-6	46
MOSSES			
Moss spp.	60	0-95	91

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
835 - 1570 (1216)M
SLOPE: 0 - 3%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)N=9

GRASS	196 (12-606)
FORBS	220 (18-584)
SHRUBS	102 (32-276)
TOTAL	485 (62-232)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j3: White Spruce/ Buffaloberry - Bearberry

(Picea glauca/ Shepherdia canadensis - Arctostaphylos uva-ursi)

n=6 This community type was recorded around Hinton, close to the borders of the Montane and Upper Foothills subregions. It is a fairly dry type, with a poor nutrient regime; as indicated by the high abundance of buffalo-berry and bearberry. It may also be somewhat windswept and dessicated; as indicated by the low tree canopy cover. This community type has very limited potential for grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	41	25-60	100
ASPEN *(Populus tremuloides)*	4	0-15	83
SHRUBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	26	3-79	100
BUFFALOBERRY *(Shepherdia canadensis)*	18	5-29	100
ROSE *(Rosa acicularis)*	8	0-23	100
WILLOW *(Salix spp.)*	4	0-17	83
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	0-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	2-5	100
ALPINE MILK VETCH *(Astragalus alpinus)*	3	0-4	100
SHOWY LOCOWEED *(Oxytropis splendens)*	4	0-8	83
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	3	0-8	83
SHOWY ASTER *(Aster conspicuus)*	6	0-24	67
LOW GOLDENROD *(Solidago missouriensis)*	2	0-5	67
GRASSES			
UPLAND SEDGES *(Carex spp.)*	11	4-20	100
HAIRY WILD RYE *(Elymus innovatus)*	1	0-2	83
SMOOTH BROME *(Bromus Inermis)*	4	0-20	33
MOSSES			
Moss spp.	42	16-79	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION:
976 (914 - 1100)M
SLOPE: 0 - 10%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=5

GRASS	146 (10-356)
FORBS	198 (70-344)
SHRUBS	124 (58-310)
TOTAL	468 (158-876)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j4: Lodgepole Pine - Black Spruce/ Labrador Tea/ Feathermoss

(Pinus contorta - Picea mariana/ Ledum groenlandicum - Pleurozium schreberi)

n=6 This community type has also been described by Corns and Annas (1986) and Beckingham et.al. (1996). It has a fire origin and can persist for over 100 years (Corns and Annas 1986). Soils in this community type tend to be acidic as indicated by the abundance of labrador tea and bog cranberry.

This community type produces little palatable of forage for domestic livestock and therefore has very limited potential for grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	53	25-85	100
BLACK SPRUCE			
(Picea mariana)	35	1-30	100
ASPEN			
(Populus tremuloides)	3	0-10	33
SHRUBS			
LABRADOR TEA			
(Ledum groenlandicum)	22	2-80	100
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	2	1-5	100
BOG CRANBERRY			
(Vaccinium vitis-idaea)	1	0-3	83
FORBS			
TWINFLOWER			
(Linnaea borealis)	2	1-3	100
BUNCHBERRY			
(Cornus canadensis)	4	0-10	83
COLTSFOOT			
(Petasites palmatus)	1	0-2	83
FIREWEED			
(Epilobium angustifolium)	1	0-2	67
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	1	0-1	67
MOSSES			
Moss spp.	74	0-95	83

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
SLOPE: 0 - 5 %
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/ac

j5: Lodgepole Pine- Black Spruce/ Feathermoss

(Pinus contorta- Picea mariana/ Moss spp.)

n=1

This community type is also described by Beckingham et. al. 1996. It produces little palatable of forage for domestic livestock and therefore is considered to have very limited potential for grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	40	-	100
BLACK SPRUCE *(Picea mariana)*	60	-	100
ASPEN *(Populus tremuloides)*	3	-	100
PAPER BIRCH *(Betula papyrifera)*	3	-	100
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	-	100
ROSE *(Rosa acicularis)*	1	-	100
LOW BUSH CRANBERRY *(Viburnum edule)*	1	-	100
FORBS			
BUNCHBERRY *(Cornus canadensis)*	1	-	100
TWINFLOWER *(Linnaea borealis)*	1	-	100
BISHOP'S-CAP *(Mitella nuda)*	1	-	100
MOSSES			
Moss spp.	60	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
SUBMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY
SLOPE: 5 %
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/ac

j6: Lodgepole Pine/ Labrador Tea- Bog Cranberry

(Pinus contorta/ Ledum groenlandicum -Vaccinium vitis-idaea)

n=17 This community type is similar to the Pl-Sb/Ledu gro - Vacc vit/ Pleu sch association of Beckingham (1993). Soils in this community type tend to be acidic as indicated by the abundance of labrador tea and bog cranberry.

This community type produces little palatable of forage for domestic livestock and therefore has limited grazing potential.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	57	18-85	100
WHITE SPRUCE			
(Picea glauca)	4	0-15	41
ASPEN			
(Populus tremuloides)	1	0-5	41
SHRUBS			
LABRADOR TEA			
(Ledum groenlandicum)	27	1-66	100
BOG CRANBERRY			
(Vaccinium vitis-idaea)	18	0-35	94
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	8	0-20	77
ROSE			
(Rosa acicularis)	4	0-10	82
BUFFALO-BERRY			
(Shepherdia canadensis)	3	0-15	59
WILLOW			
(Salix spp.)	1	0-4	47
FORBS			
BUNCHBERRY			
(Cornus canadensis)	10	0-28	94
TWINFLOWER			
(Linnaea borealis)	8	0-25	94
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	4	0-15	65
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	3	0-12	77
FIREWEED			
(Epilobium angustifolium)	3	0-12	77
STRAWBERRY			
(Fragaria virginiana)	1	0-6	41
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	4	0-17	88
MARSH REED GRASS			
(Calamagrostis canadensis)	4	0-31	65
PURPLE OAT GRASS			
(Schizachne purpurascens)	1	0-12	12
MOSSES			
Moss spp.	49	0-99	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION :
860 - 1540 (1061)M
SLOPE :
0 - 9 (3) %
ECOLLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=5

GRASS	121 (32-331)
FORBS	235 (34-457)
SHRUBS	439 (171-770)
TOTAL	800 (568-959)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j7: Lodgepole Pine/ Labrador Tea - Bearberry

(Pinus contorta/ Ledum groenlandicum - Arctostaphylos uva-ursi)

n=4 This community type often occurs on higher land near bogs. Its soils are usually coarse, low in nutrients, and acidic. White spruce is a major part of the overstory and it is expected to become dominant as this community type succeeds towards climax.

This community type does not produce very much palatable forage for livestock in its present state and is expected to produce less as white spruce exerts more dominance over the site. Therefore this community type has little potential for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	53	25-80	100
WHITE SPRUCE *(Picea glauca)*	4	0-40	75
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	28	7-41	100
BEARBERRY *(Arctostaphylos uva-ursi)*	27	0-39	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	6	4-7	100
ROSE *(Rosa acicularis)*	7	0-20	100
BUFFALOBERRY *(Shepherdia canadensis)*	5	0-12	75
FORBS			
TWINFLOWER *(Linnaea borealis)*	10	4-15	100
BUNCHBERRY *(Cornus canadensis)*	15	1-40	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	2-4	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	7	0-20	100
STRAWBERRY *(Fragaria virginiana)*	2	0-3	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-2	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	8	0-26	75
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	5	0-19	50
PURPLE OAT GRASS *(Schizachne purpurascens)*	6	0-13	50
MOSSES			
Moss spp.	61	40-83	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION :
797-975 (923)M
SLOPE : 3-5%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) N=2

GRASS	239 (228-250)
FORBS	435 (400-470)
SHRUBS	432 (432-432)
TOTAL	1106(1082-1130)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j8: Lodgepole Pine/ Green Alder

(Pinus contorta/ Alnus crispa)

n=4 This community type corresponds to the Pl-Aw/Alnus cri association of Beckingham (1993). It seems to be fairly moist and nutrient rich as indicated by the rich forb layer and high cover of green alder. According to Beckingham (1993) his Sw/Alnu cri/feathermoss association is the expected climax type. This community type seems to form on slopes that have coarse soils and underground seepage. The underground seepage makes this community type fairly moist and nutrient rich. The high amount of moisture allows green alder to proliferate and the high nutrient regime allows wild sarsaparilla to proliferate.

This community type will not be very useful for livestock grazing because the dense alder cover restricts livestock access. Therefore, it has limited potential for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	60	50-65	100
ASPEN *(Populus tremuloides)*	4	0-15	50
WHITE SPRUCE *(Picea glauca)*	3	0-10	25
SHRUBS			
GREEN ALDER *(Alnus crispa)*	16	8-34	100
ROSE *(Rosa acicularis)*	7	1-13	100
LOW BUSH CRANBERRY *(Viburnum edule)*	2	0-4	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-3	75
RASPBERRY *(Rubus idaeus)*	2	0-6	50
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	1	0-5	50
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	0-7	25
FORBS			
BUNCHBERRY *(Cornus canadensis)*	10	7-12	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	10	5-15	100
FIREWEED *(Epilobium angustifolium)*	7	4-10	100
TWINFLOWER *(Linnaea borealis)*	6	0-12	75
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-14	75
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-3	75
HEART-LEAVED ARNICA *(Arnica cordifolia)*	1	0-1	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-13	100
MOSSES			
Moss spp.	44	23-72	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC

NUTRIENT REGIME:
PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL

ELEVATION:
1143 - 1350(1256)M

SLOPE: 2 - 35 %

ASPECT: NORTH

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

TOTAL = 600*

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

*ESTIMATED

j9: Lodgepole Pine/ Fireweed

(Pinus contorta/ Epilobium angustifolium)

n=2 This community type contains mature lodgepole pine trees and has a fairly open tree canopy . This open canopy and low stem density allows for good understory forage production compared to other coniferous community types. Along with good understory forage production, access through this community type is good which increases its potential for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	43	25-60	100
SHRUBS			
ROSE			
(Rosa acicularis)	2	0-3	100
FORBS			
FIREWEED			
(Epilobium angustifolium)	24	9-38	100
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	10	8-12	100
LINDLEY'S ASTER			
(Aster ciliolatus)	6	4-8	100
STRAWBERRY			
(Fragaria virginiana)	5	3-6	100
TALL LUNGWORT OR BLUEBELLS			
(Mertensia paniculata)	4	0-7	100
DWARF RASPBERRY			
(Rubus arcticus)	3	0-4	100
RICHARDSON'S GERANIUM			
(Geranium richardsonii)	2	0-2	100
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	2	0-2	100
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	10	9-10	100
MARSH REED GRASS			
(Calamagrostis canadensis)	2	0-4	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
1380 - 1410 (1395)M
SLOPE: 2 - 30 %

ASPECT: VARIABLE

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=1

GRASS	200
FORBS	350
SHRUBS	60
TOTAL	610

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j10: Lodgepole Pine - White Spruce/ Twinflower/Moss

(Pinus contorta - Picea glauca/ Linnaea borealis/ Moss spp.)

n=8 This community type is ecologically similar to the Pl-Aw/Hylo spl - Pleu sch association of Beckingham (1993). However, this community type is more successionally advanced and white spruce is well established in the stand. As this forest grows older, white spruce will eventually replace lodgepole pine as the dominant tree species. This community type represents an intermediate state between a young seral deciduous stand and a climax white spruce - balsam fir stand.

This community type may provide a moderate amount of forage for domestic livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE			
(Pinus contorta)	36	15-55	100
WHITE SPRUCE			
(Picea glauca)	31	1-60	100
ASPEN			
(Populus tremuloides)	8	0-15	75
BALSAM POPLAR			
(Populus balsamifera)	1	0-5	13
SHRUBS			
BUFFALOBERRY			
(Shepherdia canadensis)	7	0-20	88
ROSE			
(Rosa acicularis)	3	0-6	88
BOG CRANBERRY			
(Vaccinium vitis-idaea)	5	0-19	63
LABRADOR TEA			
(Ledum groenlandicum)	5	0-17	63
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	2	0-6	50
FORBS			
TWINFLOWER			
(Linnaea borealis)	10	2-25	100
STRAWBERRY			
(Fragaria virginiana)	3	0-7	88
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	3	0-11	88
LINDLEY'S ASTER			
(Aster ciliolatus)	2	0-4	88
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	1	0-2	88
BUNCHBERRY			
(Cornus canadensis)	6	0-22	75
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	2	0-3	75
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	4	0-6	88
WHITE-GRAINED MOUNTAIN RICE GRASS			
(Oryzopsis asperifolia)	2	0-5	75
PURPLE OAT GRASS			
(Schizachne purpurascens)	2	0-8	63
MOSSES			
Moss spp.	62	0-99	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
853 - 1372 (1001)M

SLOPE: 1 - 3 %

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=5

GRASS	103 (22-144)
FORBS	282 (100-480)
SHRUBS	154 (50-490)
TOTAL	539 (225-1114)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j11: White Spruce/ Buffalo-berry

(Picea glauca/ Shepherdia canadensis)

n=1 This community type is described by Beckingham and Archibald (1996) within the Boreal Mixedwood Subregion. The dominance of white spruce has restricted soil nutrient cyling and thereby reduced understory forage production. Due to the predominance of shrubs, creating a barrier to livestock access and poor forage production this community type has very limited potential for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	65	-	100
ASPEN *(Populus tremuloides)*	10	-	100
PAPER BIRCH *(Betula papyrifera)*	5	-	100
SHRUBS			
BUFFALO-BERRY *(Shepherdia canadensis)*	10	-	100
ALDER *(Alnus crispa)*	5	-	100
ROSE *(Rosa acicularis)*	2	-	100
FORBS			
TWINFLOWER *(Linnaea borealis)*	7	-	100
BUNCHBERRY *(Cornus canadensis)*	3	-	100
COLTSFOOT *(Petasites palmatus)*	3	-	100
SWEET-CICELY *(Osmorhiza chilensis)*	3	-	100
ROUND-LEAVED WOOD VIOLET *(Viola orbiculata)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 880 M

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

GRASS	18
FORBS	46
SHRUBS	96
TOTAL	160

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

j12: White Spruce/ Moss

(Picea glauca/ Moss spp.)

n=18 This site represents a successionally mature white spruce stand. It is equivalent to Beckingham's (1993) Sw/Feathermoss community type. As these stands mature and the canopy becomes more closed, the amount of understory vegetation decreases until most of the shrub, forb, and grass layers have been eliminated and only shade-tolerant forbs and mosses remain.

This community type has limited grazing potential of the sparseness and low palatability of the vegetation.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	57	7-85	100
ASPEN			
(Populus tremuloides)	3	0-10	78
SHRUBS			
ROSE			
(Rosa acicularis)	6	1-18	100
LOW BUSH-CRANBERRY			
(Viburnum edule)	1	0-4	44
BUFFALO-BERRY			
(Shepherdia canadensis)	1	0-5	39
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	2	0-10	33
BOG CRANBERRY			
(Vaccinium vitis-idaea)	1	0-7	33
SNOWBERRY			
(Symphoricarpos occidentalis)	2	0-28	28
LABRADOR TEA			
(Ledum groenlandicum)	1	0-15	28
FORBS			
TWINFLOWER			
(Linnaea borealis)	4	0-18	94
STRAWBERRY			
(Fragaria virginiana)	3	0-7	89
CREAM-COLORED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	2	0-7	78
LINDLEY'S ASTER			
(Aster ciliolatus)	2	0-6	78
BUNCHBERRY			
(Cornus canadensis)	7	0-34	72
BISHOP'S CAP			
(Mitella nuda)	3	0-9	72
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	3	0-12	67
Marsh Reedgrass			
(Calamagrostis canadensis)	2	0-18	61
PURPLE OAT GRASS			
(Schizachne purpurascens)	1	0-10	28
WHITE-GRAINED MOUNTAIN RICE GRASS			
(Oryzopsis asperifolia)	1	0-14	22
MOSSES			
Moss spp.	67	9-96	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
777 - 1219(994) M
SLOPE: 0 - 10 %
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=12

GRASS	105 (10-318)
FORBS	307 (50-828)
SHRUBS	105 (0-270)
TOTAL	516 (70-1176)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/AC (0.01-0.1)

j13: Engelmann Spruce-Lodgepole Pine/ Cow Parsnip

(Picea engelmannii-Pinus contorta / Heracleum lanatum)

n=1 This community type was found south of Sundre, close to the boundary between the Lower and Upper Foothills Subregions. It occurred on a microsite in which the vegetation had been influenced by a cold air drainage. The vegetation of this microsite resembled a subalpine plant community.

This community type was fairly open and productive and provided good livestock grazing opportunities.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	15	-	100
LODGEPOLE PINE *(Pinus contorta)*	5	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	10	-	100
RASPBERRY *(Rubus idaeus)*	5	-	100
MOUNTAIN GOOSEBERRY *(Ribes lacustre)*	5	-	100
ROSE *(Rosa acicularis)*	3	-	100
FORBS			
TALL LUNGWORT OR BLUEBELLS *(Mertensia paniculata)*	15	-	100
COW PARSNIP *(Heracleum lanatum)*	14	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
BUNCHBERRY *(Cornus canadensis)*	4	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	26	-	100
HAIRY WILD RYE *(Elymus innovatus)*	5	-	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION: 1372 M

SLOPE: 30 %

ASPECT: NORTH

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=1

GRASS	1490
FORBS	352
SHRUBS	172
TOTAL	2014

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2 HA/AUM (4-1)
0.2 AUM/AC (0.10-0.40)

j14: White Spruce/ Willow- Bracted Honeysuckle

(Picea glauca/ Salix spp.- Lonicera involucrata)

n=2 This community type is similar to the Sw/bracted honeysuckle/fern community described by Beckingham et. al. (1996). A relatively high moisture/nutrient regime is apparent to the predominance of willow, honeysuckle and currant. The grazing potential of this community type will be dependant upon the density of shrubs in the understory.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	53	50-55	100
PAPER BIRCH			
(Betula papyrifera)	4	2-5	100
ASPEN			
(Populus tremuloides)	5	0-10	50
SHRUBS			
WILLOW			
(Salix spp.)	14	0-27	50
BRACTE HONEYSUCKLE			
(Lonicera involucrata)	21	5-37	100
ROSE			
(Rosa acicularis)	7	0-13	100
MOUNTAIN GOOSEBERRY			
(Ribes lacustre)	11	0-21	50
LOW BUSH-CRANBERRY			
(Viburnum edule)	3	0-6	50
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	2	0-3	50
FORBS			
BUNCHBERRY			
(Cornus canadensis)	31	6-55	100
TWINFLOWER			
(Linnaea borealis)	7	6-8	100
BISHOP'S CAP			
(Mitella nuda)	7	10-13	100
COLTSFOOT			
(Petasites palmatus)	3	3-3	100
STRAWBERRY			
(Fragaria virginiana)	3	0-6	100
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-6	50
TALL LUNGWORT OR BLUEBELLS			
(Mertensia paniculata)	3	0-6	50
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	3	0-5	50
FIREWEED			
(Epilobium angustifolium)	2	0-4	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	1	0-1	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY
ELEVATION: 754-884 M

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=2

GRASS	63
FORBS	425
SHRUBS	159
TOTAL	646

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/AC (0.01-0.10)

j15: White Spruce/ Alder

(Picea glauca/ Alnus crispa)

n=1 A similar community type is described by Beckingham (1996) as a Sw/green alder-river alder/fern type. The presence of both green and river alder indicates a high moisture availability, likely found near natural drainages. The density of shrub cover will restrict the movement of livestock and thereby limit the grazing potential of this community type.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	65	-	100
BALSAM POPLAR			
(Populus balsamifera)	15	-	100
ASPEN			
(Populus tremuloides)	5	-	100
SHRUBS			
GREEN ALDER			
(Alnus crispa)	20	-	100
RIVER ALDER			
(Alnus tenuifolia)	6	-	100
ROSE			
(Rosa acicularis)	22	-	100
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	19	-	100
LOW BUSH-CRANBERRY			
(Viburnum edule)	13	-	100
SASKATOON			
(Amelanchier alnifolia)	5	-	100
DOGWOOD			
(Cornus stolonifera)	3	-	100
WHITE MEADOWSWEET			
(Spirea betulifolia)	2	-	100
FORBS			
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	18	-	100
BUNCHBERRY			
(Cornus canadensis)	7	-	100
COLTSFOOT			
(Petasites palmatus)	5	-	100
LINDLEY'S ASTER			
(Aster ciliolatus)	4	-	100
TWINFLOWER			
(Linnaea borealis)	3	-	100
ONE-SIDED WINTERGREEN			
(Orthilia secunda)	2	-	100
FIREWEED			
(Epilobium angustifolium)	2	-	100
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	2	-	100
STRAWBERRY			
(Fragaria virginiana)	1	-	100
TALL LUNGWORT OR BLUEBELLS			
(Mertensia paniculata)	1	-	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	3	-	100
MOSSES			
Moss spp.	12	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION: 777 M

ECOLOGOICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=1

GRASS	28
FORBS	332
SHRUBS	124
TOTAL	484

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/AC (0.01-0.10)

j16: Black Spruce - Lodgepole Pine/ Moss

(Picea mariana - Pinus contorta/ Moss)

n=5 This community type is characterized by dense coniferous forest cover and sparse understory cover. The sites that this community type occur on are moist in the spring and dry out, somewhat, later in the growing season. According to Corns and Annas (1986), these forests are rare due to the high fire frequency. They are part of the labrador tea ecosite by Beckingham et al (1996). This ecosite generally has subhygric to subxeric moisture regimes and relatively acidic surface soil conditions.

This community type would have limited potential for livestock grazing because the dense coniferous cover reduces forage productivity to nearly zero and makes access difficult.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE			
(Picea mariana)	52	20-70	100
LODGEPOLE PINE			
(Pinus contorta)	24	6-40	100
SHRUBS			
LABRADOR TEA			
(Ledum groenlandicum)	8	0-25	80
ROSE			
(Rosa acicularis)	2	0-4	80
BOG CRANBERRY			
(Vaccinium vitis-idaea)	1	0-2	80
WILLOW			
(Salix spp.)	3	0-16	60
BLUEBERRY OR WHORTLEBERRY			
(Vaccinium myrtilloides)	1	0-3	60
SHRUBBY CINQUEFOIL			
(Potentilla fruticosa)	1	0-6	20
FORBS			
TWINFLOWER			
(Linnaea borealis)	15	0-50	100
BUNCHBERRY			
(Cornus canadensis)	6	0-9	100
STRAWBERRY			
(Fragaria virginiana)	1	0-3	60
LINDLEY'S ASTER			
(Aster ciliolatus)	1	0-2	40
FIREWEED			
(Epilobium angustifolium)	1	0-7	20
ALPINE MILK VETCH			
(Astragalus alpinus)	1	0-5	20
GRASSES			
SEDGES			
(Carex spp.)	6	0-27	60
HAIRY WILD RYE			
(Elymus innovatus)	2	0-5	60
BALTIC RUSH			
(Juncus balticus)	2	0-8	20
MOSSES			
Moss spp.	68	1-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO POORLY
ELEVATION (MEAN):
835 - 1250 (1098)M
SLOPE: 0 - 9%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

j17: White Spruce/ Horsetail/ Moss

(Picea glauca/ Equisetum pratense/ Moss)

n=2 This community is wet and nutrient rich, organic material tends to accumulate and forms a blanket of horsetail over the forest floor (Beckingham 1996),

This community type would have limited potential for livestock grazing because the dense coniferous cover reduces forage productivity to near zero and makes access difficult. However, some behaviour studies on free-ranging horses indicates that horses selectively graze horsetails, notably *Equisetum scirpoides* and *E. variegatum* during the winter and *E. arvense* in the summer.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	8	45-70	100
PAPER BIRCH *(Betula papyrifera)*	8	0-15	50
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	85	2-8	100
ROSE *(Rosa acicularis)*	2	1-3	100
WILD RED CURRANT *(Ribes triste)*	2	1-2	100
WILLOW *(Salix spp.)*	1	1-1	100
WILD GOOSEBERRY *(Ribes oxycanthoides)*	1	0-8	50
MOUNTAIN ASH *(Sorbus scopulina)*	1	0-2	50
FORBS			
HORSETAIL *(Equisetum pratense)*	58	45-70	100
(Equisetum sylvaticum)	15	0-30	50
(Equisetum arvense)	3	0-5	50
TWINFLOWER *(Linnaea borealis)*	3	2-4	100
BISHOP'S CAP *(Mitella nuda)*	3	1-5	100
BUNCHBERRY *(Cornus canadensis)*	2	1-3	100
COLTSFOOT *(Petasites palmatus)*	2	1-2	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	1-2	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	1-1	100
MOSSES			
Moss spp.	68	40-95	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC TO SUBHYDRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY TO POORLY
SLOPE: 1-2%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

j18: Black Spruce/ Labrador tea/ Horsetail/ Moss

(Picea mariana/ Ledum groenlandicum/ Equisetum arvense/ Moss spp.)

n=2 This community type occurs in association with lowland bog areas. The water table under this community type is high during the entire growing season, but flooding is rare. Succession within this community type is to white spruce but is inhibited due to poor drainage, acidic soils, and oligotrophic conditions (Beckingham 1993). Therefore, this community type is considered to be successionally mature and provides limited grazing.

PLANT COMPOSITION

	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	17	8-25	100
TAMARACK OR LARCH *(Larix laricina)*	2	0-4	50
LODGEPOLE PINE *(Pinus contorta)*	2	0-4	50
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	30	20-40	100
WILLOW *(Salix spp.)*	3	1-4	100
ROSE *(Rosa acicularis)*	6	1-10	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	2-3	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	3	2-3	100
FORBS			
HORSETAIL *(Equisetum arvense)*	43	25-60	100
BUNCHBERRY *(Cornus canadensis)*	3	1-4	100
TWINFLOWER *(Linnaea borealis)*	2	2-2	100
COLTSFOOT *(Petasites palmatus)*	2	1-2	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	1-1	100
MOSSES			
Moss spp.	45	0-90	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC HYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTHOPHIC
SOIL DRAINAGE:
IMPERFECTLY TO POORLY
SLOPE: 0 -4%
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

j19: Black Spruce/ Labrador Tea - Bog Cranberry/ Cloudberry

(Picea mariana/ Ledum groenlandicum - Vaccinium vitis-idaea/ Rubus chamaemoris)

n=10 This community type is similar to the Sb/Ledum/Rubus chamaemorus ecosystem association of Corns and Annas (1986). It is the result of infilling a bog with peat deposits as vegetation dies or by the accumulation of organic deposits in poorly drained terrain (Corns and Annas 1986). As this community type ages and accumulates more organic matter, it may move toward a drier Black Spruce/Labrador Tea/Horsetail/Moss (J18) community type.

Domestic livestock have no use for this community type because it is dominated by unpalatable plants and is too wet to be used for shelter.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE			
(Picea mariana)	36	0-60	100
TAMARACK OR LARCH			
(Larix laricina)	7	0-20	100
SHRUBS			
LABRADOR TEA			
(Ledum groenlandicum)	32	1-80	100
BOG CRANBERRY			
(Vaccinium vitis-idaea)	9	0-40	80
WILLOW			
(Salix spp.)	3	0-8	70
CLOUDBERRY			
(Rubus chamaemorus)	6	0-51	20
BOG BIRCH			
(Betula glandulosa)	8	0-34	60
FORBS			
FIELD HORSETAIL			
(Equisetum arvense)	1	0-4	50
SMALL BOG CRANBERRY			
(Oxycoccus microcarpus)	1	0-1	50
LINDLEY'S ASTER			
(Aster ciliolatus)	1	0-2	40
GRASSES			
SEDGE			
(Carex spp.)	3	0-18	40
BALTIC RUSH			
(Juncus balticus)	1	0-8	10
MOSSES			
Moss spp.	87	49-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO SUBHYDRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO POORLY
ELEVATION (MEAN):
853 - 1037(955)M
SLOPE: 0-1%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=2

GRASS	23 (10-36)
FORBS	335 (302-368)
SHRUBS	786 (592-980)
TOTAL	1144 (996-1292)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/AC

j20: Black Spruce - Larch/ Sedge/ Moss

(Picea mariana - Larix laricina/ Carex spp./ Moss spp.)

n=17 This community type is associated with lowland bogs. It usually occurs just above wet sedge meadows and, therefore, the water table is usually at or near the soil surface in the spring and slightly below it for the remainder of the year. As organics accumulate and the site becomes drier, black spruce may eventually dominate the tree canopy (Beckingham 1993). Although tamarack benefits from the better drainage that results from sphagnum accumulation, it cannot tolerate the lack of nutrients and acidity that accompanies succession to black spruce dominance (Kocaoglu and Bennett 1983).

Since this community type is flooded in the spring it may provide a good source of fresh water for livestock during part of the year. But there are not many palatable plants in this community type and, therefore, it has limited grazing potential.

PLANT COMPOSITION CANOPYCOVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE			
(Picea mariana)	40	0-99	100
TAMARACK OR LARCH			
(Larix laricina)	11	0-45	65
SHRUBS			
WILLOW			
(Salix spp.)	9	0-34	94
LABRADOR TEA			
(Ledum groenlandicum)	9	0-35	59
BOG BIRCH			
(Betula glandulosa)	7	0-30	59
FORBS			
FIELD HORSETAIL			
(Equisetum arvense)	3	0-15	59
BISHOP'S CAP			
(Mitella nuda)	1	0-4	59
LINDLEY'S ASTER			
(Aster ciliolatus)	1	0-6	53
TWIN FLOWER			
(Linnaea borealis)	4	0-13	47
BUNCHBERRY			
(Cornus canadensis)	3	0-14	47
COLTSFOOT			
(Petasites palmatus)	1	0-4	47
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	2	0-18	35
THREE-LEAVED SOLOMON'S-SEAL			
(Smilacina trifolia)	2	0-12	24
GRASSES			
SEDGES			
(Carex spp.)	12	0-71	65
WATER SEDGE			
(Carex aquatilis)	8	0-53	29
BEAKED SEDGE			
(Carex rostrata)	8	0-51	29
THREE-LEAVED SEDGE			
(Carex filifolia)	2	0-15	12
MOSSES			
Moss spp.	74	0-99	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO HYDRIC
NUTRIENT REGIME:
SUBMESOTROPHIC TO EUTROPHIC
SOIL DRAINAGE:
WELL TO VERY POORLY
ELEVATION (MEAN):
747 - 1572 (980)M
SLOPE: 0-2 %
ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA) n=9

GRASS	377 (45-1318)
FORBS	242 (10-528)
SHRUBS	137 (0-488)
TOTAL	757 (50-1318)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
40 HA/AUM
0.01 AUM/AC

j21: Tamarack or Larch/ Bog Birch/ Sedge/ Moss

(Larix laricina/ Betula glandulosa/ Carex spp./ Moss spp.)

n=2 This community type is found on topographic low positions within minerotrophic peatlands. The water table is near the soil surface, although the flowing water creates a rich nutrient regime. The decomposition of the sedges and mosses creates a thick organic soil.

Due to the high water table and nutrient rich soils, forage production may be high, however it is considered unpalatable forage due to poor access.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
TAMARACK OR LARCH			
(Larix laricina)	26	1-20	100
BLACK SPRUCE			
(Picea mariana)	12	2-8	100
SHRUBS			
BOG BIRCH			
(Betula glandulosa)	15	5-25	100
LABRADOR TEA			
(Ledum groenlandicum)	13	1-25	100
WILLOW			
(Salix spp.)	6	0-10	50
BOG CRANBERRY			
(Vaccinium vitis-idaea)	2	0-3	50
FORBS			
MARSH MARIGOLD			
(Caltha palustris)	3	2-3	100
THREE-LEAVED SOLOMON'S-SEAL			
(Smilacina trifolia)	2	2-2	100
BISHOP'S-CAP			
(Mitella nuda)	1	1-1	100
ONE-FLOWERED WINTERGREEN			
(Moneses uniflora)	45	0-45	50
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	1	0-2	50
ARROW-GRASS			
(Triglochin maritima)	1	0-2	50
GRASSES			
WATER SEDGE			
(Carex aquatilis)	2	0-4	50
SEDGES			
(Carex spp.)	2	0-3	50
MOSSES			
Moss spp.	4	0-8	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYDRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
POORLY TO VERY POORLY
SLOPE: 0%

ECOLOGICAL STATUS SCORE: 18

FORAGE PRODUCTION (KG/HA)

N/A

ECOLOGICALLY SUSTAINABLE STOCKING RATE
40 HA/AUM
0.01 AUM/AC

LOWER FOOTHILLS SUBREGION

GRAZED MODIFIED CONIFEROUS FOREST COMMUNITIES

Photo 16: A heavily grazed or modified, White Spruce/Kentucky Bluegrass/ Clover coniferous (k1) community type within the Lower Foothills Subregion. This section describes the effects of heavy grazing on mature coniferous forest community types. Normally these grazing effects are small in scale as livestock are confided by water, salting, corrals and/or fencing.

k1: Lodgepole Pine/ Kentucky Bluegrass/ Clover

(Pinus contorta/ Poa pratensis/ Trifolium spp.)

n=1 This community type represents a heavily-grazed Lodgepole pine/Bearberry (j1) or Bog Cranberry (j2) community type. Under heavy grazing pressure, the dominant native plant species decline, while grazing resistant plants like kentucky bluegrass and clover invade on to the site. Most lodgepole pine stands that have a farily good nutrient and moisture regime will move towards this community type when heavily grazed.

This community type will provide good grazing opportunities for domestic livestock because it is open, accessible, and contains palatable forage. However, the stocking rate has been reduced to help improve range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	55	-	100
ASPEN *(Populus tremuloides)*	2	-	100
SHRUBS			
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	7	-	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	-	100
LOW BUSH CRANBERRY *(Viburnum edule)*	1	-	100
FORBS			
ALSIKE CLOVER *(Trifolium hybridum)*	30	-	100
DANDELION *(Taraxacum officinale)*	14	-	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	6	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	5	-	100
TWINFLOWER *(Linnaea borealis)*	3	-	100
EARLY BLUE VIOLET *(Viola adunca)*	2	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	44	-	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	11	-	100
HAIRY WILD RYE *(Elymus innovatus)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 1143 M

SLOPE: LEVEL

ECOLOGICAL STATUS SCORE: 0-MODIFIED

FORAGE PRODUCTION (KG/HA) n=1

GRASS	336
FORBS	672
SHRUBS	336
TOTAL	1344

ECOLOGICALLY SUSTAINABLE STOCKING RATE
40 HA/AUM (40-1.35)
0.01 AUM/AC (0.01-0.30)

k2: White Spruce/ Kentucky Bluegrass/ White Clover

(Picea glauca/ Poa pratensis/ Trifolium repens)

n=2 This community type represents a heavily-grazed white spruce stand. Overgrazing has caused a reduction in the native plant species and an increase in grazing resistant species (ie. clover and dandelion). Most heavily-grazed white spruce stands that are fairly open and have a small deciduous component will move towards this community type. The stocking rate has been reduced to allow for improvement in range health.

Plant Composition

	Canopy Cover(%)		
	Mean	Range	Const.
Trees			
White Spruce			
(Picea glauca)	38	23-50	100
Aspen			
(Populus tremuloides)	8	0-15	50
Balsam Poplar			
(Populus balsamifera)	4	0-8	50
Shrubs			
Snowberry			
(Symphoricarpos occidentalis)	4	0-6	100
Rose			
(Rosa acicularis)	3	0-5	50
Willow			
(Salix spp.)	3	0-5	50
Forbs			
White Clover			
(Trifolium repens)	38	21-55	100
Dandelion			
(Taraxacum officinale)	19	6-31	100
Lindley's Aster			
(Aster ciliolatus)	10	0-18	100
Common Yarrow			
(Achillea millefolium)	4	0-8	100
Strawberry			
(Fragaria virginiana)	3	0-5	100
Veiny Meadow Rue			
(Thalictrum venulosum)	2	0-3	50
Canada Violet			
(Viola canadensis)	1	0-2	50
Grasses			
Kentucky Bluegrass			
(Poa pratensis)	19	0-37	50
Mosses			
Moss spp.	8	0-16	50

Environmental Variables

Moisture Regime:
Mesic
Nutrient Regime:
Permesotrophic
Soil Drainage:
Well
Elevation: 950 m

Slope: Level

Ecological Status Score: 0-modified

Forage Production (kg/ha) n=1

Grass	48
Forbs	598
Shrubs	132
Total	778

Ecologically Sustainable Stocking Rate
40 ha/AUM (40-1.35)
0.01 AUM/ac (0.01-0.30)

LOWER FOOTHILLS SUBREGION

FOREST CUTBLOCK COMMUNITIES

Photo 17: An Aspen/ Marsh Reed Grass/ Rose/ Fireweed cutblock community within the Lower Foothills Subregion. This community type was developed after an Aw/Rose dominated stand was logged. Forage production increased following logging, and can restrict livestock access, but will decrease as aspen densities decline.

Cutblocks

Forest harvesting affects the understory community through removal of the tree overstory as well as root destruction, soil compaction, scarification, forest floor displacement, and understory destruction. These mechanical disturbances can alter the energy flows between soil and plants which can alter the tree regeneration, species diversity and production. Logging will often increase understory production by reduced competition of understory species for light and nutrients. This increase in production is not included in the calculation of the overall carrying capacity of the disposition because these increases are only temporary. To determine the rates (ha/AUM) for grazing on harvested cutblocks the carrying capacity is based on the undisturbed mature stand (summarized by the ecosite phase). For example, l5 Aw/marsh reed grass/ rose/fireweed has an average production at 2-8 years following harvesting of 2154 kg/ha; however to ensure sustainable timber and forage production the livestock stocking is measured from e2 ecosite phase production of 917 kg/ha or 2.0 ha/AUM (Table 13).

Although cutblocks can be productive primary range for both livestock and wildlife, careful management of these areas is required to ensure that forest regeneration is successful. It is undeniable that both livestock and wildlife can cause damage to regenerating forests and in extreme situations can threaten regeneration. However, with good range management cutblocks can be grazed without seriously affecting forest regeneration and in some instances grazing can promote regeneration by removing competing vegetation.

This section describes the types of forested cutblocks found to be common throughout the Lower Foothills Subregion, these community types provide some base-line information to integrate the management of domestic livestock with forest regeneration practices. The community types were numbered sequentially from l1-l17 (Tables 1a and 13) based on an understanding of how these communities would link into the ecosite classification system identified by The Ecosite Guides of West-Central (Beckingham et. al. 1996) and Southwestern Alberta (Archibald et. al. 1996). This attempts to bridge the gap of understanding between forest and range management practioners by recognizing the values of both forage and fibre production. It is recommended that integrating range and forest resources should occur using the information provided in the ecosite phase summary (Table 13). Ecosite phase summary tables are provided for the more common community types, i.e. e2_harvest Aw and f2_harvest Aw-Pb.

Table 12. Forage production summary for forest cutblock community types of the Lower Foothills subregion

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
c hairy wild rye submesic/ medium	**Ecosite phase**	**c1 hairy wild rye Pl**						
	Ecosite phase	**c1_harvest Pl**						**8 (0.05)**
	l1	WGMG/bearberry/Pl-Aw	293	309	284	886	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**c3 hairy wild rye Aw-Sw-Pl**						
	Ecosite phase	**c3_harvest Aw-Sw-Pl**						**2.53 (0.16)**
	l2	Aw/hairy wild rye/dwarf bilberry-labrador tea	1786	111	232	2129	8-2 (0.05-0.20)	2.53 (0.16)
	Ecosite phase	**c4 hairy wild rye Sw**						
	Ecosite phase	**c4_harvest Sw**						**8 (0.05)**
	l3	buffalo-berry/bearberry/Sw	432	765	222	1419	40-4 (0.01-0.10)	8 (0.05)

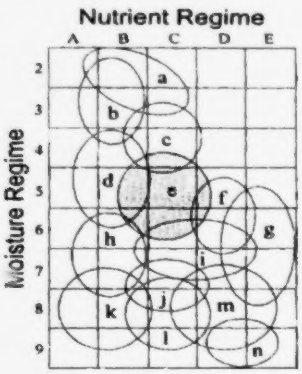
Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e1 low-bush cranberry Pl**						
	Ecosite phase	**e1_harvest Pl**						**8 (0.05)**
	l4	Pl/hairy wild rye/rose	578	419	88	1084	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e1_harvest_grazed Pl**						**20 (0.02)**
	m1	Aw-Pl/alder/clover/kentucky bluegrass	885	821	503	2210	40-4 (0.01-0.10)	20 (0.02)
	Ecosite phase	**e2 low-bush cranberry Aw**						
	Ecosite phase	**e2_harvest Aw**						**2.30 (0.18)**
	l5	Aw/marsh reedgrass/rose/fireweed	722	806	515	2044	4.05-1 (0.1-0.4)	2.0 (0.2)
	l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	2300 *	13.5-1.01 (0.03-0.4)	2.89 (0.14)
	l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	10-1.35 (0.04-0.3)	2.0 (0.2)
	Ecosite phase	**e2_harvest_grazed Aw**						**5.33 (0.23)**

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	1200 *	40-2.89 (0.01-0.14)	4 (0.10)
	m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	40-4 (0.01-0.1)	8 (0.05)
	m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	40-1.93 (0.01-0.21)	4 (0.10)
	Ecosite phase	**e3 low-bush cranberry Aw-Sw-Pl**						**2.38 (0.17)**
	Ecosite phase	e3_harvest Aw-Sw-Pl	240	116	1400	1756		
	l8	Aw/willow/purple oatgrass/dwarf bilberry	240	116	1400	1756	8.09-2 (0.05-0.2)	2.38 (0.17)
	Ecosite phase	**e3_harvest_grazed Aw-Sw-Pl**						**8 (0.05)**
	m5	clover/timothy/buffalo-berry/Pl-Sw	3090	658	322	4070	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**e4 low-bush cranbery Sw**						
	Ecosite phase	**e4_harvest Sw**						**8 (0.05)**
	l9	moss/marsh reedgrass	1184	455	116	1755	40-4 (0.01-0.10)	8 (0.05)

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honyesuckle Aw-Pb**						
	Ecosite phase	**f2_harvest Aw-Pb**						**2.5 (0.18)**
	110	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	2500 *	2.7-1.93 (0.15-0.21)	2.13 (0.19)
	111	marsh reedgrass/Pb/wild raspberry/fireweed	1853	1044	53	4424	4-1 (0.1-0.4)	1.93 (0.21)
	112	Pb/green alder/marsh reedgrass	n/a	n/a	n/a	2750 *	13.5-1.01 (0.03-0.4)	2.0 (0.2)
	113	marsh reedgrass/Bw-Aw/willow	1492	1264	420	3176	8-2 (0.05-0.2)	4 (0.1)
	Ecosite phase	**f3 bracted honeysuckle Aw-Sw-Pl**						
	Ecosite phase	**f3_harvest Aw-Sw-Pl**						**8 (0.05)**
	114	fireweed/green alder/Pl-Sw	325	1210	1075	2610	40-4 (0.01-0.10)	8 (0.05)
	Ecosite phase	**f4 bracted honeysuckle Sw**						

Ecosite	Community number	Community type	Productivity (kg/ha)				Stocking Rate ha/AUM (AUM/ac)	
			Grass	Forb	Shrub	Total	Range	Recommended
	Ecosite phase	**f4_harvest Sw**						**8 (0.05)**
	I15	Sw/willow/marsh reedgrass	761	846	1	1608	40-4 (0.01-0.10)	8 (0.05)
h labrador tea-subhygric subhygric/ poor	**Ecosite phase**	**h1 labrador tea Sb-Pl**						
	Ecosite phase	**h1_harvest Sb-Pl**						**40 (0.01)**
	I16	Pl-Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)
j labrador tea/ horsetail hygric/ medium	**Ecosite phase**	**j1 labrador tea/horestail Sb-Sw**						
	Ecosite phase	**j1_harvest Sb-Sw**						**40 (0.01)**
	I17	willow/hair-like sedge/Sw	n/a	n/a	n/a	n/a	40 (0.01)	40 (0.01)

Ecosite Phase
e2 low-bush cranberry_harvest Aw n=43



CHARACTERISTIC SPECIES

Tree [22] aspen
[3] balsam poplar*
[1] white birch*
[1] white spruce*

Shrub [8] prickly rose
[6] wild red raspberry
[4] bracted honeysuckle
[4] green alder
[3] low-bush cranberry
[2] aspen*
[1] beaked hazelnut*
[1] snowberry*
[1] saskatoon*

Forb [7] fireweed
[5] wild strawberry
[3] palmate-leaved coltsfoot
[3] dewberry
[3] wild sarsaparilla
[3] lindley's aster
[3] bunchberry
[2] northern bedstraw
[2] tall lungwort
[2] cream-colored vetchling
[1] american vetch

Grass [20] marsh reedgrass

SITE CHARACTERTISTICS

Moisture Regime: subhyric^{4}, mesic^{2}
Nutrient Regime: rich^{4}, medium^{2}
Topographic Position: lower slope^{3}, mid slope^{1}, upper slope^{2}
Slope: (2-5)^{4}, (10-15)^{2}
Aspect: northerly^{3}, westerly^{1}

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)^{6}, (0-5)^{4}
Humus Form: mor^{6}, raw moder^{3}
Surface Texture: SiL^{2}, SL^{2}, L^{1}, Si^{1}
Effective Texture: C^{3},CL^{2}, SCL^{1}, SiC^{1}, SiCL^{1}
Depth to Mottles/Gley: none^{7}, (0-25)^{2}
Drainage: well^{5}, mod.well^{4}, imperfect^{1}
Parent Material: M^{5}, GF^{1}
Soil Subgroup: O.GL^{3}, BR.GL^{3}, GL.GL^{1}, E.EB^{1}
Soil type: SM4^{8}, SD4^{1}

PLANT COMMUNITY TYPES (N)

15 Aw/marsh reedgrass/rose/fireweed (39)
16 raspberry/marsh reedgrass/Aw (2)
17 beaked hazelnut/Aw/wild sarsaparilla (2)

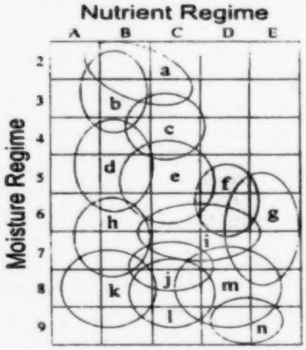
Total 2084 (1036-3992)

ECOLOGICALLY SUSTAINABLE STOCKING RATE:

2.18 ha/AUM
0.17 AUM/ac

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.
** Soil Characteristics are from e2 low-bush cranberry Aw Ecosite Phase summary.

Ecosite Phase
f2 bracted honeysuckle_ harvest Aw-Pb n=6



CHARACTERISTIC SPECIES

Tree

[10] balsam poplar
[8] aspen
[4] white birch*
[2] white spruce*

Shrub

[8] wild red raspberry
[5] willow*
[4] aspen*
[4] green alder*
[4] bracted honeysuckle*
[3] prickly rose
[2] currant*
[1] balsam poplar*
[1] low-bush cranberry*

Forb

[9] common horsetail
[4] fireweed
[4] tall lungwort
[3] Lindley's aster
[3] cowparsnip*
[2] wild sarsaparilla*
[2] showy aster
[2] palmate-leaved coltsfoot
[2] wild strawberry
[1] dewberry
[1] common dandelion

Grass

[18] marsh reedgrass

SITE CHARACTERTISTICS

Moisture Regime: subhyric^{7}, mesic^{3}
Nutrient Regime: rich^{7}, medium^{3}
Topographic Position: lower slope^{5}, mid slope^{2}, upper slope^{3}
Slope: (2-5)^{7}, (10-15)^{3}
Aspect: northerly^{5}, westerly^{5}

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)^{7}, (0-5)^{3}
Humus Form: mor^{7}, raw moder^{3}
Surface Texture: SiL^{4}, L^{1}, SL^{1}, CL^{1}, SiCL^{1}
Effective Texture: C^{3},SiCL^{1}, SiC^{1}, hC^{1}, SC^{1},CL^{1}
Depth to Mottles/Gley: none^{4}, (0-25)^{4}, (26-50)^{1}
Drainage: imperfect^{3}, mod.well^{3},well^{2}, poor^{1}
Parent Material: M^{4}, GF^{1}, F^{1}
Soil Subgroup: O.LG^{2},GL.GL^{1}, BR.GL^{1}, O.EB^{1}, E.EB^{1}
Soil type: SM4^{7}, SWm^{1}

PLANT COMMUNITY TYPES (N)

110 Aw/bracted honeysuckle/horsetail (1)
111 marsh reedgrass/Pb/wild raspberry/fireweed (2)
112 Pb/green alder/marsh reedgrass (1)
113 marsh reedgrass/Bw-Aw/willow (2)

ECOLOGICALLY SUSTAINABLE STOCKING RATE:

11.84 ha/AUM
01.3 AUM/ac

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

I1: Lodgepole Pine- Aspen/ Bearberry/ White-grained Mountain Rice Grass

(Pinus contorta- Populus tremuloides/ Arctostaphylos uva-ursi/ Oryzopsis asperifolia)

n=2 This community type represents a clear-cut lodgepole pine forest which is regenerating to both pine and aspen (j1). The predominanace of white-grained mountain rice grass in this community type may be related to disturbance from fire or grazing. It appears that white-grained mountain rice grass increases in abundance with moderate grazing.

** Soil Characteristics are from f2 bracted honeysuckle

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	10	6-14	100
BEARBERRY			
(Arctostaphylos uva-ursi)	5	0-10	50
LABRADOR TEA			
(Ledum groenlandicum)	3	1-5	100
ROSE			
(Rosa acicularis)	3	2-3	100
BUCKBRUSH OR SNOWBERRY			
(Symphoricarpos occidentalis)	3	0-5	50
LODGEPOLE PINE SAPLINGS			
(Pinus contorta)	3	2-3	100
ASPEN SAPLINGS			
(Populus tremuloides)	2	0-2	100
TWINFLOWER			
(Linnaea borealis)	5	2-7	100
FORBS			
CREAM-COLORED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	5	4-4	100
LINDLEY'S ASTER			
(Aster ciliolatus)	5	4-5	100
STRAWBERRY			
(Fragaria virginiana)	4	1-6	100
FIREWEED			
(Epilobium angustifolium)	4	0-6	100
NORTHERN GENTIAN			
(Gentiana amarella)	1	0-1	100
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	1	0-1	100
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	1	0-2	100
GRASSES			
WHITE-GRAINED MOUNTAIN RICE GRASS			
(Oryzopsis asperifolia)	24	18-30	100
HAIRY WILD RYE			
(Elymus innovatus)	12	5-18	100
MARSH REED GRASS			
(Calamagrostis canadensis)	4	0-7	100
MOSSES			
Moss spp.	22	20-23	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHICTO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
960 -1204 (1082)M
SLOPE: 0 - 15 %

FORAGE PRODUCTION (KG/HA) N=2

GRASS	293 (136-450)
FORBS	309 (210-408)
SHRUBS	284 (267-300)
TOTAL	886 (811-960)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

12: Aspen/ Dwarf Bilberry- Labrador Tea/ Hairy Wild Rye

(Populus tremuloides/ Vaccinium caespitosum- Ledum groenlandicum/ Elymus innovatus)

n=5 This community type formed by clear-cut logging a mature mixed stand of white spruce - aspen and perhaps logdepole-pine (h9 or h10). After harvest the aspen suckered vigorously and have established dominance. While there is still a good number of white spruce saplings, they will not become dominant until the aspen has undergone natural thinning to allow the white spruce some room and light to grow.

The abundance of hairy wild rye, dwarf bilberry, and labrador tea indicate that this site has poor soil nutrients.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS			
(Populus tremuloides)	38	0-80	80
WHITE SPRUCE SAPLINGS			
(Picea glauca)	10	0-50	40
DWARF BILBERRY			
(Vaccinium caespitosum)	8	3-14	100
ROSE			
(Rosa acicularis)	5	1-13	100
LABRADOR TEA			
(Ledum groenlandicum)	4	0-12	100
BLUEBERRY			
(Vaccinium myrtilloides)	3	0-12	20
GREEN ALDER			
(Alnus crispa)	2	0-10	20
FORBS			
BUNCHBERRY			
(Cornus canadensis)	8	0-19	100
STRAWBERRY			
(Fragaria virginiana)	7	1-11	100
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	4	0-7	100
FIREWEED			
(Epilobium angustifolium)	4	0-6	100
NORTHERN BEDSTRAW			
(Galium boreale)	3	0-7	100
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	11	4-16	100
MARSH REED GRASS			
(Calamagrostis canadensis)	12	0-45	60
PINE GRASS			
(Calamagrostis rubescens)	6	0-18	40
PURPLE OAT GRASS			
(Schizachne purpurascens)	3	0-7	100
UPLAND SEDGES			
(Carex spp.)	2	0-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
792 - 1143 (966)M
SLOPE: 0 - 6 %
ASPECT: VARIABLE

FORAGE PRODUCTION (KG/HA) N=2

GRASS	1786 (1616-1956)
FORBS	111 (98-124)
SHRUBS	232 (192-272)
TOTAL	2129 (2012-2246)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.53 HA/AUM (8-2)
0.16 AUM/ac (0.05-0.20)

I3: White Spruce/ Buffalo-berry- Bearberry

(Picea glauca/ Shepherdia canadensis- Arctostaphylos uva-ursi)

n=2 This community type is formed by clear-cut logging a White Spruce/Buffalo-berry/Bearberry (j3) community type. By removing the tree canopy the grass and forb layers have increased significantly due to the higher availability of sunlight. Clear-cutting also removes the physical barriers that occur with forested conditions. The removal of physical barriers and the increased understory production, has made this site more useful to grazing livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	3	0-5	50
BALSAM POPLAR *(Populus balsamifera)*	2	0-3	50
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	12	0-22	100
BEARBERRY *(Arctostaphylos uva-ursi)*	10	1-17	100
ROSE *(Rosa acicularis)*	4	3-5	100
WHITE SPRUCE SAPLINGS *(Picea glauca)*	2	1-2	100
BALSAM POPLAR SAPLINGS *(Populus balsamifera)*	1	0-1	50
FORBS			
STRAWBERRY *(Fragaria virginiana)*	14	9-19	100
AMERICAN VETCH *(Vicia americana)*	7	0-12	100
CLOVER *(Trifolium spp.)*	5	3-6	100
NORTHERN BEDSTRAW *(Galium boreale)*	3	1-4	100
COMMON YARROW *(Achillea millefolium)*	2	0-2	100
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	2	0-3	50
STAR-FLOWERED SOLOMON'S SEAL *(Smilacina stellata)*	1	0-1	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	25	8-42	100
NORTHERN AWNLESS BROME *(Bromus pumpellianus)*	15	0-30	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
976-1100 (1038)M
SLOPE : 1-5%
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA) N=2

GRASS	432 (374-490)
FORBS	765 (732-798)
SHRUBS	222 (118-326)
TOTAL	1419 (1224-1614)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

I4: Lodgepole pine/ Rose/ Hairy Wild Rye

(Pinus contorta/ Rosa acicularis/ Elymus innovatus)

n=12 This community type was formed by clear-cut logging lodgepole pine forests (j9) approximately ten years ago. After clear-cutting, aspen did not sucker vigorously on this site because of the nutrient poor, sandy soils. Because aspen did not take over the site, lodgepole pine was able to reestablish its dominance. The nutrient poor, sandy soil conditions also favor the growth of dwarf bilberry and hairy wild rye, which are codominants on the site.

This community type may provide some grazing opportunities, but the dense growth of lodgepole pine and aspen make access difficult and limit understory production.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
LODGEPOLE PINE SAPLINGS *(Pinus contorta)*	11	0-50	67
ASPEN SAPLINGS *(Populus tremuloides)*	6	0-45	75
ROSE *(Rosa acicularis)*	3	0-10	100
DWARF BILBERRY *(Vaccinium caespitosum)*	4	0-27	67
BEARBERRY *(Arctostaphylos uva-ursi)*	4	0-12	67
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-10	58
FORBS			
FIREWEED *(Epilobium angustifolium)*	4	0-16	92
BUNCHBERRY *(Cornus canadensis)*	2	0-5	92
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-4	83
DANDELION *(Taraxacum officinale)*	1	0-8	83
TWINFLOWER *(Linnaea borealis)*	1	0-5	75
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-7	58
WILD STRAWBERRY *(Fragaria virginiana)*	2	0-14	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	10	2-17	100
SEDGE *(Carex spp.)*	3	0-15	75
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-14	58
MOSSES			
Moss spp.	27	0-54	83

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
1143 -1572 (1214)M
SLOPE: 0 - 5%
ASPECT: SOUTHERLY

FORAGE PRODUCTION (KG/HA) N=10

GRASS	578 (104-1550)
FORBS	419 (42-964)
SHRUBS	88 (16-288)
TOTAL	1084 (186-2468)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

I5: Aspen/ Rose/ Fireweed/ Marsh Reed Grass

(Populus tremuloides/ Rosa acicularis/ Epilobium angustifolium/ Calamagrostis canadensis)

n=39 This community type formed after clear-cut logging an Aspen/Rose (e7) community type. The logging probably occurred two to eight years ago. After logging, more light reaches the understory and grasses and forbs are able to flourish. As the aspen reestablishes itself, it rapidly gains dominance on the site. As aspen forms and fills in an overstory canopy, marsh reed grass will decline and rose, along with other shrubs and forbs, will become more abundant.

This community type provides fairly good grazing opportunities in its early stages, but gradually excludes grazing livestock as the aspen saplings grow taller and form barriers to livestock movement through the area.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	25	0-80	92
BALSAM POPLAR *(Populus balsamifera)*	3	0-26	49
WHITE OR PAPER BIRCH *(Betula papyrifera)*	2	0-4	33
SHRUBS			
ROSE *(Rosa acicularis)*	8	0-28	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-27	80
LOW BUSH CRANBERRY *(Viburnum edule)*	3	0-15	90
RASPBERRY *(Rubus idaeus)*	5	0-19	74
TREMBLING ASPEN SAPLINGS *(Populus tremuloides)*	2	0-20	15
FORBS			
FIREWEED *(Epilobium angustifolium)*	7	0-14	97
STRAWBERRY *(Fragaria virginiana)*	5	0-12	90
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-7	85
CREAM-COLORED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-9	82
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-13	92
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-17	87
BUNCHBERRY *(Cornus canadensis)*	3	0-15	85
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-11	85
WILD SARSAPARILLA *(Aralia nudicaulis)*	3	0-13	80
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	21	0-56	95

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
754 - 1143 (937)M
SLOPE: 0 -35%
ASPECT: SOUTHEASTERLY

FORAGE PRODUCTION (KG/HA) N=15

GRASS	722 (42-1600)
FORBS	806 (120-1616)
SHRUBS	515 (52-1782)
TOTAL	2044 (386-3992)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 HA/AUM (4.05- 1.0)
0.2 AUM/ac (0.1-0.40)

16:Raspberry/ Marsh Reed Grass/ Aspen

(Rubus idaeus/ Calamagrostis canadensis/ Populus tremuloides)

n=2 This community type represents an Aspen / Alder or Aspen / Rose (e5, e6 and e7) community type that has been harvested, scarified, and planted to white spruce seedlings . This additional ground disturbance was created to provide suitable microsites for white spruce seedling establishment; however, with the dominance of raspberry and marsh reed grass these planted seedlings were unsuccessfully established. This community provides good grazing opportunities in its early stages after harvest, but as the trembling aspen and shrubs grow taller they form barriers that exclude livestock by limiting their movement.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	6	4-7	100
WHITE OR PAPER BIRCH			
(Betula papyrifera)	5	3-5	100
SHRUBS			
RASPBERRY			
(Rubus idaeus)	18	15-21	100
ROSE			
(Rosa acicularis)	3	0-6	100
FORBS			
RED CLOVER			
(Trifolium pratense)	4	0-8	100
FIREWEED			
(Epilobium angustifolium)	3	2-3	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	2	2-2	100
DANDELION			
(Taraxicum officianalis)	2	0-3	100
STRAWBERRY			
(Fragaria virginiana)	2	2-2	100
SHOWY ASTER			
(Aster conspicuous)	1	0-1	100
FIELD HORSETAIL			
(Equisetum arvense)	2	0-4	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	9	6-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION:
920-940 M
SLOPE: 2%
ASPECT: WESTERLY

FORAGE PRODUCTION (KG/HA)

TOTAL 2300*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.89 HA/AUM (13.5-1.01)
0.14 AUM/ac (0.03-0.4)

17: Beaked Hazelnut/Aspen/Wild Sarsaparilla

(Corylus cornuta/Populus tremuloides/Aralia nudicaulis)

n=2 This community type formed after clear-cutting an Aw/hazelnut/wild sarsaparilla forest (e11) community type. The presence of beaked hazelnut appears to be indicative of warmer sites that may have some fire history (Downing and Karpuk 1992). The opening of the canopy after logging seems to have allowed hazelnut to proliferate, possibly due to the increased light penetration and thus an increase in temperature. As aspen continues to mature, hazelnut may decline. Density of regenerating aspen and hazelnut may limit potential grazing.

PLANT COMPOSITION CANOPY COVER(%)

	Mean	Range	Const.
Shrubs			
Aspen saplings *(Populus tremuloides)*	17	6-27	100
Beaked Hazelnut *(Corylus cornuta)*	38	21-55	100
Rose *(Rosa acicularis)*	14	4-23	100
Saskatoon *(Amelanchier alnifolia)*	7	5-8	100
Wild red raspberry *(Rubus idaeus)*	5	1-10	100
Snowberry *(Symphoricarpos occidentalis)*	5	4-5	100
Forbs			
Wild sarsaparilla *(Aralia nudicaulis)*	15	4-25	100
Strawberry *(Fragaria virginiana)*	4	2-5	100
Dewberry *(Rubus pubescens)*	3	2-4	100
Tall lungwort *(Mertensia paniculata)*	2	1-3	100
Palmated coltsfoot *(Petasites palmatus)*	2	1-2	100
Fairybells *(Disporum trachycarpum)*	2	1-2	100
Grasses			
Marsh Reed grass *(Calamagrostis canadensis)*	4	3-4	100
Fringed Brome grass *(Bromus ciliolatus)*	3	1-4	100
Hairy Wild rye *(Elymus innovatus)*	1	1	100

ENVIRONMENTAL VARIABLES

Moisture Regime: Mesic

Nutrient Regime: Mesotrophic

Soil Drainage: Well

Elevation: 686 m

Slope: Level

FORAGE PRODUCTION IN KG/HA:n=1

Grass	742
Forbs	190
Shrubs	104
Total	1036

Ecologically sustainable stocking rate
2 ha/AUM (10-1.35)
0.2 AUM/ac (0.04-0.3)

I8: Aspen/ Willow/ Purple Oat Grass/ Dwarf Bilberry

(Populus tremuloides/ Salix spp./ Schizachne purpurascens/ Vaccinium caespitosum)

n=1 This community type was formed by selectively logging a White Spruce - Aspen forest (h9 or e15). After the trees were harvested, the aspen suckered vigorously, choking out the white spruce seedlings. Succession back to a mixedwood white spruce - aspen forest will be very slow.

This community type has a fairly high water table, which has allowed willows to proliferate. The denseness of the willows makes access into this community type difficult for livestock and therefore use is limited.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS *(Populus tremuloides)*	75	-	100
WILLOW *(Salix spp.)*	40	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	11	-	100
SASKATOON *(Amelanchier alnifolia)*	3	-	100
RASPBERRY *(Rubus idaeus)*	2	-	100
TWINFLOWER *(Linnaea borealis)*	6	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	-	100
SMOOTH ASTER *(Aster laevis)*	4	-	100
DANDELION *(Taraxacum officinale)*	4	-	100
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	3	-	100
WHITE CLOVER *(Trifolium repens)*	3	-	100
MEADOW PARSNIP *(Zizia aptera)*	2	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	2	-	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	2	-	100
GRASSES			
PURPLE OAT GRASS *(Schizachne purpurascens)*	22	-	100
UPLAND SEDGE *(Carex spp.)*	11	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	-	100
HAIRY WILD RYE *(Elymus innovatus)*	2	-	100
BALTIC RUSH *(Juncus balticus)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY
ELEVATION: 914 M
SLOPE: LEVEL

PRODUCTION IN KG/HA:n=1

GRASS	240
FORBS	116
SHRUBS	1400
TOTAL	1756

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.38 HA/AUM (8.09-2.0)
0.17 AUM/ac (0.05-0.20)

I9: Moss/ Marsh Reed Grass

(Moss spp./ Calamagrostis canadensis)

N=7 This community type was formed by logging a White Spruce/feathermoss forest type (j12). The lower soil pH and higher soil moisture restricted aspen suckering, however it has allowed willows to proliferate, thereby restricting white spruce seedling emergence.

The denseness of the willows makes access into this community type difficult for livestock and therefore use is limited.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	2	1-8	100
ROSE *(Rosa acicularis)*	2	1-11	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-5	86
ASPEN SAPLINGS *(Populus tremuloides)*	1	0-5	71
FORBS			
FIREWEED *(Epilobium angustifolium)*	1	1-5	100
TALL LUNGWORT *(Mertensia paniculata)*	1	1-2	86
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	86
STRAWBERRY *(Fragaria virginiana)*	3	2-5	71
PALMATED COLTSFOOT *(Petasites palmatus)*	1	0-2	71
COMMON DANDELION *(Taraxacum officinale)*	1	0-6	71
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	9	3-28	100
HAIRY WILD RYE *(Elymus innovatus)*	6	1-11	100
SEDGE SPP. *(Carex spp.)*	5	0-15	71
MOSSES			
MOSS SPP.	73	33-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1234 M

SLOPE: (2-5%)

FORAGE PRODUCTION IN KG/HA:n=4

GRASS	1184 (855-1786)
FORBS	455 (84-813)
SHRUBS	116 (45-232)
TOTAL	1755 (1079-2129)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

110: Aw/ Bracted honeysuckle/ horsetail

(Populus tremuloides/ Lonicera involucrata/ Equisetum spp.)

N=1 This community type was formed by harvesting a Aw/bracted honeyscuckle (e12) forest type. After the trees were harvested, aspen and balsam saplings suckered vigorously along with various shrubs. The soil moisture/nutrient regime permitted a high diversity, and production of shrubs, and forbs to develop.

The denseness of the trees and shrubs makes access into this community type difficult for livestock and therefore use is limited.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	20	-	100
BALSAM POPLAR (*Populus balsamifera*)	10	-	100
SHRUBS			
ASPEN SAPLINGS (*Populus tremuloides*)	22	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	15	-	100
WILD RED RASPBERRY (*Rubus idaeus*)	10	-	100
CURRANT SPP. (*Ribes spp.*)	9	-	100
BALSAM POPLAR SAPLINGS (*Populus balsamifera*)	8	-	100
RIVER ALDER (*Alnus tenuifolia*)	4	-	100
PAPER BIRCH SAPLINGS (*Betula papyrifera*)	3	-	100
ROSE *(Rosa acicularis)*	3	-	100
FORBS			
COMMON FIELD HORSETAIL (*Equisetum arvense*)	10	-	100
MEADOW HORSETAIL (*Equisetum pratense*)	10	-	100
DEWBERRY (*Rubus pubescens*)	4	-	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	3	-	100
BUNCHBERRY (*Cornus canadensis*)	3	-	100
LINDLEY'S ASTER (*Aster ciliolatus*)	2	-	100
FIREWEED (*Epilobium angustifolium*)	2	-	100
TALL LUNGWORT (*Mertensia paniculata*)	2	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY
ELEVATION: 950 M
SLOPE: (2-5%)
ASPECT: SOUTHWESTERLY

FORAGE PRODUCTION IN KG/HA:n=0

GRASS*	1200 *estimated
FORBS*	800
SHRUBS*	500
TOTAL*	2500

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.13 HA/AUM (2.7-1.93)
0.19 AUM/ac (0.15-0.21)

I11: Marsh Reed Grass/ Balsam Poplar/ Raspberry/ Fireweed

(Calamagrostis canadensis/ Populus balsamifera/ Rubus idaeus/ Epilobium angustifolium)

n=2 This community type formed after harvesting an deciduous stand, Aw-Pb-Bw/rose/marsh reed grass (f4) which were used as skiing runs down Whitecourt Mountian. Without continued disturbance these linear disturbances will slowly revert back to an Aw-Pb stand due to shrub and tree encroachment from neighbouring mature deciduous stands.

This community type can provide excellent grazing opportunities, unless tree and shrub densities restrict livestock access.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BALSAM SAPLINGS *(Populus balsamifera)*	9	3-15	100
ASPEN SAPLINGS *(Populus tremuloides)*	3	0-5	50
PAPER BIRCH *(Betula papyrifera)*	3	0-5	50
RASPBERRY *(Rubus idaeus)*	7	2-11	100
WILLOW *(Salix spp.)*	2	1-3	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-5	50
LOW-BUSH CRANBERRY *(Viburum edule)*	1	1	100
FORBS			
TALL LUNGWORT *(Mertensia paniculata)*	9	6-11	100
FIREWEED *(Epilobium angustifolium)*	6	5-6	100
COWPARSNIP *(Heracleum lanatum)*	5	5	100
VEINY MEADOWRUE *(Thalictrum venulosum)*	5	1-9	100
OAK FERN *(Gymnocarpium dryopteris)*	5	1-7	100
PALMATED COLTSFOOT *(Petasites palmatus)*	3	1-5	100
BANEBERRY *(Actaea rubra)*	3	2-3	100
LINDLEY'S ASTER *(Aster ciliolatus)*	2	1-2	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	22	11-32	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1171 M
SLOPE: 25%
ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=2

GRASS	1853 (432-3274)
FORBS	1044
SHRUBS	53 (0-106)
TOTAL	4424

ECOLOGICALLY SUSTAINABLE STOCKING RATE
1.93 HA/AUM (4-1)
0.21 AUM/ac (0.1-0.4)

112: Balsam Poplar/Green Alder/ Marsh Reed Grass

(Populus balsamifera/ Alnus crispa/ Calamagrostis canadensis)

n=1 This community type formed after clear-cut logging an Aw-Pb/green alder forest (f6) community type. This area is effected by a high (or perched) water table as indicated by the presence of balsam saplings and green alder The high water table in this community type may be partially caused by the clear-cutting. Clear-cutting deciduous stands causes the water table to rise because, even though the amount of water going into the site is the same, the amount of transpiration and water leaving the site is greatly reduced.

This community type may provide good grazing opportunities as a mature stand; however the density of green alder and balsam poplar will restrict domestic access until natural thinning occurs in later seral stages.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
BALSAM SAPLINGS *(Populus balsamifera)*	23	-	100
GREEN ALDER (*Alnus crispa*)	18	-	100
RASPBERRY *(Rubus idaeus)*	14	-	100
ROSE *(Rosa acicularis)*	8	-	100
SNOWBERRY (*Symphoricarpos occidentalis*)	5	-	100
LOW-BUSH CRANBERRY (*Viburum edule*)	2	-	100
FORBS			
HEART-LEAVED ARNICA (*Arnica cordifolia*)	11	-	100
COWPARSNIP (*Heracleum lanatum*)	9	-	100
STRAWBERRY (*Fragaria virginiana*)	5	-	100
SHOWY ASTER (*Aster conspicuus*)	4	-	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	-	100
AMERICAN VETCH (*Vicia americana*)	4	-	100
COMMON HORSETAIL (*Equisetum arvense*)	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	14	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1128 M
SLOPE: 5-7 %
ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA:

TOTAL	2750 *

*ESTIMATED

ECOLOGICALLY SUSTAINABLE STOCKING RATE
2.0 HA/AUM (13.5-1.01)
0.2 AUM/AC (0.03-0.4)

113: Marsh Reed Grass/ Bw-Aw/ Willow

(Calamagrostis canadensis/ Betula glandulosa- Populus tremuloides/ Salix spp.)

n=1 This community type formed after clear-cut logging a mature Aspen - Balsam Poplar forest (f13). It is fairly moist and maintains a high water table. The high moisture regime on this site allows moisture-adapted species such as paper birch, balsam poplar, willow, and field horsetail to predominate.

This community type may provide good grazing opportunities as a mature stand; however the density of green alder and balsam poplar will restrict domestic access until natural thinning occurs in later seral stages.

PLANT COMPOSITION CANOPY COVER(%)

TREES	MEAN	RANGE	CONST.
PAPER BIRCH			
(Betula papyrifera)	5	-	100
WHITE SPRUCE			
(Picea glauca)	5	-	100
BALSAM POPLAR			
(Populus balsamifera)	5	-	100
ASPEN			
(Populus tremuloides)	2	-	100
SHRUBS			
PAPER BIRCH SAPLINGS			
(Betula papyrifera)	10	-	100
WILLOW			
(Salix spp.)	26	-	100
ASPEN SAPLINGS			
(Populus tremuloides)	9	-	100
BALSAM POPLAR SAPLINGS			
(Populus balsamifera)	5	-	100
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	3	-	100
CURRANT SPP.			
(*Ribes spp.*)	3	-	100
FORBS			
FIELD HORSETAIL			
(Equisetum arvense)	27	-	100
LINDLEY'S ASTER			
(Aster ciliolatus)	5	-	100
FIREWEED			
(Epilobium angustifolium)	4	-	100
CANADA GOLDENROD			
(*Solidago canadensis*)	4	-	100
SHOWY ASTER			
(*Aster conspicuus*)	3	-	100
TALL LUNGWORT			
(*Mertensia paniculata*)	1	-	100
GRASSES			
MARSH REED GRASS	43	-	100
(Calamagrostis canadensis)			

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 884 M
SLOPE: 1%
ASPECT: NORTHERLY

FORAGE PRODUCTION KG/HA:

GRASS	1492
FORBS	1264
SHRUBS	420
TOTAL	3176

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (8-2)
0.1 AUM/ac (0.05-0.2)

114: Lodgepole Pine- White Spruce/ Green Alder/ Fireweed

(Pinus contorta- Picea glauca/ Alnus crispa/ Epilobium angustifolium)

n=3 This community type is formed by clear-cut logging a mature Lodgepole Pine/ Green Alder (j8) community type. It is supplied with water from upslope which enables the site to support a healthy stand of green alder. Fireweed became dominant on this site after harvest because of its ability to quickly establish on disturbed sites.

In areas where the shrub cover is low, the lush understory may make this community type attractive to grazing livestock. Where the shrub cover is high and productivity is lower as a result of shading, grazing potential would be limited.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
LODGEPOLE PINE SAPLINGS *(Pinus contorta)*	8	2-17	100
WHITE SPRUCE SAPLINGS *(Picea glauca)*	3	2-5	68
GREEN ALDER *(Alnus crispa)*	16	12-18	100
RASPBERRY *(Rubus idaeus)*	11	6-13	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	1-6	68
ROSE *(Rosa acicularis)*	2	1-6	68
FORBS			
FIREWEED *(Epilobium angustifolium)*	56	25-72	100
BUNCHBERRY *(Cornus canadensis)*	5	1-5	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	12	0-22	68
SHOWY ASTER *(Aster conspicuus)*	2	2-5	68
COW PARSNIP *(Heracleum lanatum)*	5	13	33
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	7	5-7	100
UPLAND SEDGES *(Carex spp.)*	3	1-7	100
HAIRY WILD RYE *(Elymus innovatus)*	7	1-18	68
MOSSES			
Moss spp.	7	1-20	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 1340 - 1680 M

SLOPE: 5 - 35 %

ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=2

GRASS	325 (200-450)
FORBS	1210 (410-2010)
SHRUBS	1075 (980-1170)
TOTAL	2610 (1780-3440)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

j15: White Spruce/ Willow/ Marsh reed grass

(Picea glauca/ Salix spp./ Calamagrostis canadensis)

n=1 This community type is formed by clear-cut logging a mature white spruce forest (j14). The presence of willow, cowparnsip, horestail, and tall larkspur indicates a relatively high soil moisture availability; as well, smooth brome, and clover, indicate a moderate level of disturbance via seeding or grazing.

Where the shrub cover is high and productivity is lower as a result of shading, this community type would have limited grazing potential.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	5	-	100
SHRUBS			
WHITE SPRUCE SAPLINGS *(Picea glauca)*	10	-	100
WILLOW *(Salix spp.)*	8	-	100
ROSE *(Rosa acicularis)*	15	-	100
RASPBERRY *(Rubus idaeus)*	7	-	100
SNOWBERRY *(Symphoricarpos alba)*	2	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	-	100
FORBS			
COWPARSNIP *(Heracleum lanatum)*	7	-	100
CANADA GOLDENROD *(Solidago canadensis)*	7	-	100
WESTERN WILLOW ASTER *(Aster hesperius)*	5	-	100
NARROW-LEAVED HAWKWEED *(Hieracium umbellatum)*	4	-	100
VEINY MEADOWRUE *(Thalictrum venulosum)*	4	-	100
CLOVER SPP. *(Trifolium spp.)*	4	-	100
THREE-LEAVED FALSE SOLOMON'S-SEAL *(Smilacina trifolia)*	3	-	100
TALL LARKSPUR *(Delphinium glaucum)*	3	-	100
SWAMP HORSETAIL *(Equisetum fluviatile)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	35	-	100
SMOOTH BROME *(Bromus inermis.)*	25	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 721 M

SLOPE: 20 %

ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=1

GRASS	761
FORBS	846
SHRUBS	1
TOTAL	1608

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

116: Lodgepole pine-Black Spruce/ Labrador tea/ Horsetail/ Moss

(Pinus contorta var. latifolia - Picea glauca/ Ledum groenlandicum./ Equisetum arvense/ Moss spp.)

n=2 This community type is formed by clear-cut logging a mature Black Spruce - Lodgepole Pine forest (j16) community. The dominance of black spruce, labrador tea indicate a relatively moist but poor nutrient soil condition. The dominance of shrubs and unpalatable understorey limites grazing potential for livestock.

PLANT COMPOSITION CANOPY COVER(%)

SHRUBS	MEAN	RANGE	CONST.
LODGE-POLE PINE *(Pinus contorta var. latifolia)*	35	25-45	100
BLACK SPRUCE *(Picea mariana)*	11	10-13	100
PAPER BIRCH *(Betula papyrifera)*	6	2-10	100
WILLOW *(Salix spp.)*	10	10	100
LABRADOR TEA *(Ledum groenlandicum)*	16	7-25	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	1-3	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	1-2	100
FORBS			
WOODLAND HORSETAIL *(Equisetum sylvaticum)*	4	3-5	100
COMMON HORSETAIL *(Equisetum arvense)*	3	2-4	100
FIREWEED *(Epilobium angustifolium)*	3	1-4	100
LINDLEY'S ASTER	2	1-2	100
STRAWBERRY *(Fragaria virginiana)*	1	1-2	100
PALAMATED COLTSFOOT *(Petasites palmatus)*	1	1-2	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	2	1-2	100
MOSSES			
MOSS SPP.	48	0-95	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY TO POORLY
ELEVATION: 600 M
SLOPE: 1-3%
ASPECT: EASTERLY/WESTERLY

FORAGE PRODUCTION KG/HA:
TOTAL = 850*
*ESTIMATED

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/ac

117: Willow/ Hair sedge/White spruce

(Salix spp./ Carex capillaris/ Picea glauca)

n=4 This community type is formed by clear-cut logging a mature White Spruce - Black Spruce (j17) community type. A relatively high water table after logging has allowed willow and sedge species to dominate the site, and restricting emergence of planted spruce seedlings. These conditions and the dominance of unpalatable forage species limit the potential for livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

TREES	MEAN	RANGE	CONST.
WHITE SPRUCE *(Picea glauca)*	1	1-3	100
SHRUBS			
WILLOW *(Salix spp.)*	36	30-41	100
BUFFALO-BERRY *(Sheperdia canadensis)*	2	1-4	100
ROSE *(Rosa acicularis)*	2	1-3	75
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-3	75
FORBS			
NORTHERN BEDSTRAW *(Galium boreale)*	5	3-6	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	1-4	100
COMMON HAREBELL *(Campanula rotundifolia)*	1	1	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-8	75
SWAMP HORESTAIL *(Equisetum fluviatile)*	3	1-8	75
WOOLLY PUSSYTOES *(Antennaria lanata)*	2	2	75
SMALL WOOD ANEMONE *(Anemone parviflora)*	2	1-2	75
GRASSES:			
HAIR SEDGE *(Carex capillaris)*	15	7-23	100
HAIRY WILD RYE *(Elymus innovatus)*	12	1-20	100
WIRE RUSH *(Juncus balticus)*	2	1-2	100
KENTUCKY BLUE GRASS *(Poa pratensis)*	1	0-4	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: POOR
ELEVATION: 1152 M
SLOPE: 3 %
ASPECT: WESTERLY

FORAGE PRODUCTION KG/HA:
TOTAL = 650*
*ESTIMATED

ECOLOGICALLY SUSTAINABLE STOCKING RATE
GENERALLY NON-USE
40 HA/AUM
0.01 AUM/ac

GRAZED MODIFIED FOREST CUTBLOCK COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 18: An grazed aspen cutblock community type within the Lower Foothills Subregion. Aspen forests within the Lower Foothills Subregion are under increasing demands from the timber and livestock industries. These community types illustrate the effects of heavy grazing regimes on early successional forest communities following harvesting.

Grazed Modified Forest Cutblocks

The effects of domestic livestock grazing on forest cutblocks is varied depending on site and imposed management practices. Generally, imposing a seasonal light grazing regime (< 25% utilization) on cutblock area does not effect deciduous or conifer regeneration. However, when seasonal moderate to heavy grazing regimes (>30% utilization) are imposed livestock foraging and trampling damage has a significant effect on regeneration (Table 13).

The grazed modified community types described in this section are due to moderate to heavy grazing regimes imposed over several years and thereby have restricted the regrowth of deciduous and coniferous seedlings. In order to sustain required regeneration standards domestic grazing must be restricted to allow replanted seedlings to establish and dominate the area. If these retreated cutblocks become properly regenerated domestic grazing can again be imposed; however, the stocking (ha/AUM) must be based on a mature forested community, thereby most aspen and conifer communities would have a sustained grazing level of < or = 2.0 ha/AUM. A summary of Aw grazed modified cutblocks is provided within e2_harvest_grazed ecosite phase.

Table 13. Characteristics of aspen regeneration under three skidding treatments, following 2 years of moderate grazing (Lane 1998).

Skidding Intensity	**Aspen density (stems/ha)**		**Aspen stem height (cm)**		**Aspen Stem diameter (mm)**		**Aspen Biomass (kg/ha)**	
	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed
Light	34 300	26 000	99	59	12	8	1 640	300
Heavy	33 100	21 500	72	43	9	7	547	294
Very Heavy	13 200	11 400	55	35	8	6	255	47
Average	26 900	19 600	76	46	10	7	814	214
Reduction (%)	27		39		30		74	

Ecosite Phase
e2 low-bush cranberry_harvest_grazed Aw n=17

CHARACTERISTIC SPECIES

Understory Tree

[5] aspen*
[2] balsam poplar*
[1] white spruce*

Shrub

[5] prickly rose
[2] wild red raspberry*
[2] aspen*
[2] willow*
[1] green alder*
[1] Canada buffalo-berry*
[1] twin-flower*

Forb

[22] clover spp.
[10] wild strawberry
[7] dandelion
[4] fireweed
[3] Lindley's aster*
[2] common yarrow
[2] dewberry*
[1] cream-colored vetchling
[1] wild lily-of-the-valley
[1] bunchberry*
[1] palmate-leaved coltsfoot*
[1] american vetch*

Grass

[13] kentucky bluegrass
[5] marsh reedgrass
[4] hairy wild-rye
[3] timothy*
[3] sedge spp.*

SITE CHARACTERTISTICS

Moisture Regime: subhyric^{4}, mesic^{2}
Nutrient Regime: rich^{4}, medium^{2}
Topographic Position: lower slope^{3}, mid slope^{1}, upper slope^{2}
Slope: (2-5)^{4}, (10-15)^{2}
Aspect: northerly^{3}, westerly^{3}

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)^{6}, (0-5)^{4}
Humus Form: mor^{6}, raw moder^{3}
Surface Texture: SiL^{2}, SL^{2}, L^{1}, Si^{1}
Effective Texture: C^{3},CL^{2}, SCL^{1}, SiC^{1}, SiCL^{1} **Depth to Mottles/Gley:** none^{7}, (0-25)^{2}
Drainage: well^{5}, mod.well^{4}, imperfect^{1}
Parent Material: M^{5}, GF^{1}
Soil Subgroup: O.GL^{3}, BR.GL^{3}, GL.GL^{1},E.EB^{1}
Soil type: SM4^{8}, SD4^{1}

PLANT COMMUNITY TYPES (N)

m3 Aw/buffalo-berry/clover (1)
m4 strawberry-clover/rose/marsh reedgrass (7)
m5 kentucky bluegrass/clover-dandelion (9)

ECOLOGICALLY SUSTAINABLE STOCKING RATE:

2.18 ha/AUM
0.17 (AUM/ac)

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.
** Soil Characteristics are from f2 bracted honeysuckle Aw-Pb Ecosite Phase summary.

m1: Aspen- Lodgepole Pine/ Alder/ Clover/ Kentucky Bluegrass

(Populus tremuloides- Pinus contorta/ Alnus crispa/ Trifolium repens/ Poa pratensis)

n=4 This community type formed by clear-cut logging a mature Lodgepole Pine(j8) /Green Alder (l14) community type and then broadcasting creeping red fescue and clover seed over the cutblock. Lodgepole pine has not yet been able to reestablish on this site because of the high competition from aspen and green alder. As the aspen grows it will shade out the green alder, undergo natural thinning, and then allow lodgepole pine to reestablish on the site.

This community type produces good forage but stocking rate declines as desity of shrubs and regenerating trees increases. The stocking rate has been reduced to help improve range health.

Plant Composition Canopy Cover(%)

	Mean	Range	Const.
Trees			
Aspen *(Populus tremuloides)*	32	12-65	100
Lodgepole Pine *(Pinus contorta)*	19	0-50	75
Shrubs			
Green Alder *(Alnus crispa)*	11	0-20	75
Raspberry *(Rubus idaeus)*	3	0-5	100
Rose *(Rosa acicularis)*	5	0-18	100
Low Bush Cranberry *(Viburnum edule)*	1	0-4	75
Forbs			
White Clover *(Trifolium repens)*	22	4-34	100
Dandelion *(Taraxacum officinale)*	8	4-13	100
Strawberry *(Fragaria virginiana)*	7	0-16	100
Wild Lily-of-the-Valley *(Maianthemum canadense)*	1	0-1	100
Common Yarrow *(Achillea millefolium)*	2	0-3	75
Fireweed *(Epilobium angustifolium)*	2	0-3	75
Palmate-Leaved Coltsfoot *(Petasites palmatus)*	1	0-2	75
Bunchberry *(Cornus canadensis)*	3	0-9	50
Lindley's Aster *(Aster laevis)*	2	0-4	50
Grasses			
Marsh Reed Grass *(Calamagrostis canadensis)*	3	0-5	100
Kentucky Bluegrass *(Poa pratensis)*	8	0-25	75
Timothy *(Phleum pratense)*	6	0-16	75
Creeping Red Fescue *(Festuca rubra)*	12	0-40	50

Environmental Variables

Moisture Regime:
Mesic
Nutrient Regime:
Mesotrophic
Soil Drainage:
Moderately Well
Elevation (mean):
1082-1372 (1185)m
Slope: 2-5%
Aspect: Northerly

Forage Production (kg/ha)n=3

Grass	885 (356-1500)
Forbs	821 (734-980
Shrubs	503 (110-700)
Total	2210 (1200-3180)

Ecologically sustainable stocking rate
20 ha/AUM (40-4)
0.02 AUM/ac (0.01-0.10)

m2: Aspen/ Buffalo-berry/ Clover

(Populus tremuloides/ Shepherdia canadensis/ Trifolium spp.)

n=1 This community type describes the effects of harvesting and grazing disturbances on mature deciduous (e3, 15, 16) community type. The adequate moisture/nutrient regime has held tree and shrub production in good standing ;however, the presence of periodic, intensive grazing has altered the herbaceuous understory by the dominance of clover, dandelion, and to a lesser extent strawberry. This system should be able to sustain deciduous regeneration while maintaining a long-term forage base for domestic grazing. Stocking rate has been lowered to help improve range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	30	-	100
BALSAM POPLAR *(Populus balsamifera)*	20	-	100
BLACK SPRUCE *(Picea mariana)*	15	-	100
WHITE OR PAPER BIRCH *(Betula papyrifera)*	3	-	100
SHRUBS			
BUFFALO-BERRY *(Shepherdia canadensis)*	15	-	100
WILLOW *(Salix spp.)*	10	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	-	100
PRICKLY ROSE *(Rosa acicularis)*	2	-	100
WILD ROSE *(Rosa woodsii)*	2	-	100
FORBS			
ALSIKE CLOVER *(Trifolium hybridum)*	10	-	100
FIREWEED *(Epilobium angustifolium)*	6	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	-	100
BUNCHBERRY *(Cornus canadensis)*	3	-	100
COMMON YARROW *(Achillea millefolium)*	2	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
BISHOP'S CAP *(Mitella nuda)*	2	-	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUGHYGRIC
NUTRIENT REGIME:
PERMESOTROHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION:
N/A
SLOPE: N/A
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA)

TOTAL 1200*
(*ESTIMATED)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (40-2.89)
0.10 AUM/ac (0.01-0.14)

m3: Strawberry- Clover/ Rose/ Marsh Reedgrass

(Fragaria viginiana - Trifolium spp./ Rosa acicularis/ Calamagrostis canadensis)

n=7 This community type describes the effects of heavy grazing Aw/marsh reed grass/rose/fireweed (e7 and l5) harvested community type. Low-growing forbs such as strawberry and clover indicate a moderate to heavy grazing regime for at least 2 to 3 growing seasons. With continued heavy grazing grazing succession will alter this to a kentucky bluegrass/clover-dandelion (m4) community. In order to sustain deciduous regeneration domestic grazing must be restricted to allow aspen and balsam suckers to emerge and profilerate. The stocking rate has been reduced to help improve range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	6	0-34	43
SHRUBS			
PRICKLY ROSE			
(Rosa acicularis)	8	3-12	100
WILLOW			
(Salix spp.)	4	0-20	57
ASPEN SAPLINGS			
(Populus tremuloides)	5	0-25	57
TWINFLOWER			
(Linnea boreale)	2	0-10	29
FORBS			
STRAWBERRY			
(Fragaria virginiana)	21	2-40	100
WHITE CLOVER			
(Trifolium repens)	16	0-40	86
FIREWEED			
(Epilobium angustifolium)	4	0-20	86
DANDELION			
(Taraxacum officianalis)	2	0-4	86
CREAM-COLORED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	2	0-5	86
AMERICAN VETCH			
(Vicia americana)	3	0-14	71
LINDLEY'S ASTER			
(Aster ciliolatus)	4	0-12	57
INDIAN PAINTBRUSH			
(Castilleja miniata)	2	0-20	57
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	2	0-15	57
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	10	1-20	100
HAIRY WILD RYE			
(Elymus innovatus)	4	0-15	71
KENTUCKY BLUEGRASS			
(Poa Pratensis)	2	0-5	57
TIMOTHY			
(Phleum pratense)	2	0-7	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
945-1016 (981)M
SLOPE: 0-8%
ASPECT: SOUTHEASTERLY

FORAGE PRODUCTION (KG/HA)N=3

GRASS	405 (168-806)
FORBS	331 (116-618)
SHRUBS	541 (76-1400)
TOTAL	1277 (504-1756)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

m4: Kentucky bluegrass/ Clover/ Dandelion

(Poa pratensis/Trifolium spp./ Taraxacum officinale)

n=9 This community type is formed by heavily grazing an Aspen/ Rose/ Marsh Reed Grass(e7 or 15) community type. With heavy grazing, clover dandelion, and kentucky bluegrass invade into the site and eventually dominate it if heavy grazing occurs frequently. The stocking rate has been reduced to improve range health.

PLANT COMPOSITION CANOPY COVER(%)

SHRUBS	MEAN	RANGE	CONST.
ASPEN SAPLINGS *(Populus tremuloides)*	3	0-20	66
WHITE SPRUCE SEEDLINGS (*Picea glauca*)	2	0-10	66
ROSE *(Rosa acicularis)*	2	0-4	89
RASPBERRY *(Rubus idaeus)*	2	0-7	44
WILLOW (*Salix spp.*)	1	0-5	66
FORBS			
CLOVER *(Trifolium spp.)*	25	0-63	89
DANDELION *(Taraxacum officinale)*	12	0-22	89
FIREWEED *(Epilobium angustifolium)*	4	1-11	100
COMMON YARROW *(Achillea millefolium)*	3	1-5	100
STRAWBERRY *(Fragaria virginiana)*	2	0-5	89
WILD LILY OF THE VALLEY (*Maianthemum canadense*)	1	0-3	89
LINDLEY'S ASTER *(Aster ciliolatus)*	2	0-12	56
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	23	2-59	100
TIMOTHY *(Phleum pratense)*	4	0-11	78
SEDGE *(Carex spp.)*	4	0-14	78
HAIRY WILD RYE *(Elymus innovatus)*	4	0-12	78
CREEPING RED FESCUE *(Festuca rubra)*	3	0-15	22
MARSH REED GRASS *(Calamagrostis canadensis)*	1	0-3	56

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 914 - 1250 M
SLOPE: 0 - 2%

FORAGE PRODUCTION IN KG/HA:N=6

GRASS	1048 (152-2448)
FORBS	408 (132-1218)
SHRUBS	33 (0-110)
TOTAL	1489 (400-2888)

ECOLOGICALLY SUSTAINABLE STOCKING RATE
4 HA/AUM (40-1.93)
0.10 AUM/ac (0.01-0.21)

m5: Clover/ Timothy/ Buffalo-berry/ Lodgepole Pine- White Spruce

(Trifolium spp./ Phleum pratense/ Sheperdia canadensis/ Pinus contorta- Picea glauca)

n=1 This community type represents an 8-10 year old lodgepole pine cutblock, (e3) Aw-Sw-Pl/buffalo-berry. Some of the early regeneration has been by balsam poplar and aspen, much of which has been heavily browsed by wildlife and livestock. The presence of clover, timothy and kentucky bluegrass also indicates heavy grazing and browsing pressure. Timothy, clover and kentucky bluegrass are more resistent to heavy grazing pressure than the native forbs and grasses.

This community type provides a good forage base for domestic livestock, but the stocking rate has been lowered to improve range health.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE			
(Picea glauca)	10	-	100
LODGEPOLE PINE			
(Pinus contorta)	10	-	100
BALSAM POPLAR			
(Populus balsamifera)	3	-	100
TREMBLING ASPEN			
(Populus tremuloides)	3	-	100
SHRUBS:			
BUFFALOBERRY	14	-	100
(Sheperdia canadensis)			
ROSE	5	-	100
(Rosa acicularis)			
GREEN ALDER			
(Alnus crispa)	5	-	100
WILLOW			
(Salix spp.)	3	-	100
FORBS			
WHITE CLOVER	34	-	100
(Trifolium repens)			
STRAWBERRY	5	-	100
(Fragaria virginiana)			
COMMON YARROW	3	-	100
(Achillea millefolium)			
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	2	-	100
COMMON RED PAINTBRUSH			
(Castilleja miniata)	1	-	100
GRASSES			
TIMOTHY			
(Phleum pratense)	22	-	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	19	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1371 M
SLOPE: 1%
ASPECT: NORTH

FORAGE PRODUCTION IN KG/HA: N=1

GRASS	3090
FORBS	658
SHRUBS	322
TOTAL	

ECOLOGICALLY SUSTAINABLE STOCKING RATE
8 HA/AUM (40-4)
0.05 AUM/ac (0.01-0.10)

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